DRAFT

Charlotte-Mecklenburg County, NC
Center City Corridor
Center City Streetcar Project

Project Management Plan

Conceptual Design Phase

January, 2005
Revision 0 - DRAFT

Project Sponsor:
City of Charlotte
Charlotte Area Transit System
600 East Fourth Street
Charlotte-Mecklenburg Government Center
Charlotte, North Carolina 28202

Center City / Streetcar Corridor
PROJECT MANAGEMENT PLAN

DOCUMENT REVISION RECORD	
CHANGES	**EFFECTIVE DATE**
REVISION 0	
REVISION 1	
REVISION 2	

Document Revision Policy

The Project Management Plan is updated and issued as a stand-alone document. Previous revisions of this document should be discarded or stamped (identified) as superseded or obsolete when a new revision is issued. CATS Senior Project Manager will determine the distribution of this document. For additional copies, please contact CATS Quality Assurance Department (704) 336-2961.

This document is available electronically on the CATS internal drive:
K:\Documents\Charlotte Area Transit System\Manuals.doc.

PREPARED BY:
Jerry D. Roberson
Assistant Project Manager
CHARLOTTE AREA TRANSIT SYSTEM

APPROVALS:

_____ _____
Willie Noble **Date**
Center City / Streetcar Corridor Senior Project Manager

_____ _____
John Muth **Date**
Deputy Director of Development

_____ _____
Ronald Tober **Date**
Chief Executive Officer

Summary of Changes to the Southeast Corridor Project Management Plan

Revision __

Location	Change	Explanation

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

TABLE OF APPENDICES

LIST OF ACRONYMS

AAP	Affirmative Action Plan
ADA	Americans with Disabilities Act
A&E	Architecture & Engineer
BAFO	Best and Final Offer
BRT	Bus Rapid Transit
CATS	Charlotte Area Transit System
CDOT	Charlotte Department of Transportation
CEO	Chief Executive Officer
CM	Construction Management
CMPC	Charlotte Mecklenburg Planning Commission
CMT	Corridor Management Team
CPCC	Central Piedmont Community College
CPE	Continuing Preliminary Engineering
CPM	Critical Path Method
CPMP	Corridor Program Management Plan
CVS	Certified Value Specialists
DBE	Disadvantaged Business Enterprises
DDD	Deputy Director for Development
DEIS	Draft Environmental Impact Statement
DOT	Department of Transportation
EEO	Equal Employment Opportunity
EIS	Environmental Impact Statement
E/PM	Engineering/Property Management
FEIS	Final Environmental Impact Statement
FFGA	Full Funding Grant Agreement
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FY	Fiscal Year
GF	Gannett Fleming Inc.
G&A	General and Administrative
HOV	High Occupancy Vehicle
KBE	Key Business Executive
KBU	Key Business Unit
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
LRV	Light Rail Vehicles
MIS	Major Investment Study
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transit Commission
MUMPO	Mecklenburg-Union Metropolitan Planning Organization
NCDOT	North Carolina Department of Transportation
NEPA	National Environmental Policy Act
NoDa	North Davidson Street area
NSRR	Norfolk Southern Railroad

PB	Parsons Brinckerhoff Quade & Douglas, Inc.
PE	Preliminary Engineering
PE/EIS	Preliminary Engineering/Environmental Impact Statement
PHA	Preliminary Hazard Analysis
PMO	Project Management Oversight
PMP	Project Management Plan
PMSSC	Program Management Support Services Consultant
PMT	Program Management Team
PIP	Project Implementation Plan
POP	Project Operations Plan
PQP	Project Quality Plan
PST	Program Steering Team
PTG	Parsons Transportation Group
RFP	Request for Proposals
QA	Quality Assurance
QAP	Quality Assurance Program
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
QP	Quality Plan
RE	Resident Engineer
ROW	Right-of-way
SAVE	Society of American Value Engineers
SFFGA	State Full Funding Grant Agreement
SSMP	Safety and Security Management Plan
TOD	Transit Oriented Development
USDOT	United States Department of Transportation
VE	Value Engineering
VETC	Value Engineering Coordination
WBS	Work Breakdown Schedule
Y&S	Yard & Shop

1 PURPOSE AND DESCRIPTION

1.1 The Project

The Center City / Streetcar Corridor Project (CCSC), managed by the Charlotte Area Transit System (CATS), will provide streetcar service along the Trade Street corridor in the heart of the city's business center (called "Uptown" or "Center City") to Presbyterian Hospital on the near-eastside along Elizabeth Avenue and to Johnson C. Smith University on the near-westside at Beatties Ford Road. Subsequent streetcar line extensions will be pursued to the east along Hawthorn Lane and Central Avenue to Eastland Mall and to the west along Beatties Ford Road to I-85. An additional extension will be a loop line around the center city, intersecting with the Trade Street line on the east side and west side of the center city core. Streetcar vehicles will operate in the existing street right-of-way and will share stops with existing fixed-route buses along most of its 14-mile length. Some 5,000 daily riders are expected to utilize the initial service, an estimated total 7,000 riders expected once the extensions come online. **Figure 1-1** illustrates the proposed alignments. Additional substantial future growth projected as new Transit Oriented Development (TOD) investments and activities take place along the line.

The new CCSC will be located within a short walk to most of Uptown Charlotte's major employment centers and will connect with other CATS corridors, express and local bus services, as well as with the Transportation Center on East Trade Street and the planned Multi-Modal Center on West Trade Street where non-CATS services will include Amtrak, with intercity passenger rail service south to Atlanta and north to Raleigh and Washington, as well as Greyhound intercity bus service.

The design and construction of the CCSC and associated infrastructure improvements will be undertaken separately from CATS capital projects for which Federal funding will be sought. CCSC projects will be funded from local sources.

1.2 Project History

The proposed Center City / Streetcar Corridor project represents the culmination of several years of land use and transportation planning by local officials and citizens.

In 1994, the City of Charlotte and Mecklenburg County approved the *Centers and Corridors Vision*, a comprehensive guide for future land use and development in the region. As part of this plan, future development and redevelopment in the region would be focused along five major transportation corridors that were strong candidates for transit service and transit-oriented development. These recommendations were affirmed by the Mecklenburg-Union Metropolitan Planning Organization and included in its *2015 Transportation Plan* for the region.

In support of the *Centers and Corridors Vision*, the *2025 Integrated Transit/Land Use Plan* was completed in 1998. A key element of this plan was the development of a regional rapid transit system that would improve mobility, encourage balanced growth, and support the proposed land use initiatives in each of the region's five growth corridors. A wide range of alternative transit options and land use scenarios were evaluated for each of the five corridors.

Figure 1-1: Proposed Streetcar Alignments

In November 1998, Mecklenburg County residents approved a local sales and use tax (0.5 percent) to support the implementation of the *2025 Integrated Transit/Land Use Plan.* Transit improvements in the five corridors, including the Center City, were also programmed in the region's *2020 Transportation Plan.*

In November 2002, the Charlotte City Council adopted the *2025 System Plan*, which included the streetcar mode as the Locally Preferred Alternative for the Center City Corridor.

1.3 Lead Agency

The Charlotte Area Transit System (CATS) is the regional public transportation system serving the Charlotte-Mecklenburg County region of North Carolina. CATS is the operating name of the Public Transit Department within the City of Charlotte. CATS was created in 1999 pursuant to an Interlocal Agreement between the City of Charlotte, Mecklenburg

County, and the six towns (Davidson, Cornelius, Huntersville, Mint Hill, Matthews, and Pineville) in the county to develop and operate a regional transportation system for the area.

The Interlocal Agreement (see **Appendix A** for full agreement) creating CATS provides for the following:

(1) Creation of the Metropolitan Transit Commission (MTC) as the governing body for CATS, providing policy direction to the development and operation of the regional transit system and to oversee allocation of the 0.5 percent sales tax for transit approved by the voters in 1998 and other resources available to support CATS.

The MTC is made up of the eight chief elected officials of the eight units of local government as voting members; the eight chief administrative officers of the eight units of local government as alternates; ex-officio representatives of the five adjacent counties; and the North and South Carolina Boards of Transportation.

(2) Vesting with the City of Charlotte the responsibility for serving as administrative agent for CATS. In this capacity, the City appropriates and disburses CATS funds; awards contracts, applies for and receives federal and state grants on behalf of CATS, and provides various administrative support functions for CATS. The Chief Executive Officer of CATS and all other CATS employees are employees of the City of Charlotte. The Chief Executive Officer serves as the "Chief Transit Official", with responsibility for carrying out the policy direction established by the MTC and reports administratively to the Charlotte City Manager.

(3) Establishment of various procedures for preparing an annual transit program and budget, preparation of long-range operating and capital plans, and for various other activities associated with the governance and administration of the public transportation system in the Charlotte-Mecklenburg region.

(4) Establishment of "maintenance of effort" payments in perpetuity for the operation of the public transportation system by the City of Charlotte, Mecklenburg County, and the Town of Huntersville, based on the 1998 expenditure levels of each governmental unit and for public transportation services.

(5) A review of the governance structure for CATS in 2004 to assess its continued suitability for creating a regional public transportation system.

This type of public transportation governance structure is consistent with past practice in the Charlotte-Mecklenburg area. The City of Charlotte has administrative responsibility for several functions that are regional in scope, including the Charlotte-Mecklenburg Utilities Department, the Charlotte-Mecklenburg Planning Commission, the Charlotte-Mecklenburg Police Department, and Charlotte-Douglas International Airport. Further, the structure places the public transportation system function in the same administrative forum as the region's primary land use planning agency, the Charlotte-Mecklenburg Planning Commission, thereby reinforcing the region's commitment to integrating land use planning and public

transportation to create a more transit-oriented, pedestrian-friendly land development pattern.

Under the governance structure described above, the City of Charlotte would be the grant recipient for Federal Transit Administration (FTA) and North Carolina Department of Transportation (NCDOT) funds to design, construct, and operate the CCSC, in the event that federal and state funds are pursued, and the Director of Public Transit for the City, serving as Chief Executive Officer for CATS, would be the public official responsible and accountable for carrying out the Project in accordance with FTA and NCDOT requirements. However, the current understanding is that the CCSC project will be funded solely from local City of Charlotte funding.

1.3.1 Memorandum of Understanding between Charlotte and FTA

CATS and the Federal Transit Administration (FTA) are developing a Memorandum of Understanding (**Appendix B**) to document mutual understanding of the procedures to be followed to address National Environmental Policy Act (NEPA), FTA New Starts, and metropolitan planning requirements for the 2025 Transit System Plan. Because the 2025 Transit System Plan's implementation could extend over 20 years, the Memorandum of Understanding (MOU) documents the understanding of the process for current and future participants.

The MOU outlines an approach that involves further evaluation and development of the proposed projects in the System Plan by meeting the FTA requirements for Alternatives Analysis, NEPA, and Preliminary Engineering. CATS will adhere to the procedures contained in the MOU in the event CATS decides to pursue federal funding for the CCSC project.

1.3.2 Approach

Under the MOU, CATS and FTA agreed to preparation of a separate Draft Environmental Impact Statement (DEIS) / Draft Environmental Assessment (DEA) for four corridors in accordance with the regulations implementing NEPA at 40 CFR Parts 1500-1508 and 23 CFR Part 771 as follows:

- North Corridor Commuter Rail and Charlotte Multi-Modal Station
- Northeast Corridor LRT, an extension of South Corridor LRT services
- Southeast/West Corridor Bus Rapid Transit (BRT) or LRT
- Center City/Central Avenue/Beatties Ford Road Streetcar

In the event CATS pursues federal funding, CATS will perform the following steps:

- CATS will consider the results of the DEIS / DEA and the public and interagency comments on those DEIS / DEA and will identify projects for which CATS will request FTA approval to begin PE and to gain entry into the New Starts funding pipeline.

- CATS and FTA agree that the DEIS / DEA will evaluate potential refinements to the recommended elements of the 2025 Transit System Plan. These elements reflect input from the NEPA scoping process and the regional and corridor analyses conducted previously. DEIS / DEA alternatives will include the No-Build and Build

alternatives from the System Plan, with possible design options and phasing of the projects to ensure that operable segments result from each phase. In addition, CATS will develop a TSM alternative for each corridor and submit each TSM alternative to FTA for approval of its use as the New Starts Baseline alternative in the computation of FTA New Starts Criteria.

- Following circulation of one or more of the DEIS / DEA and consideration of comments received, CATS can reach decisions on the phasing and prioritization of the various elements and operable segments of the transit System Plan. CATS will seek FTA approval to initiate PE on an early implementation phase (EIP) of the System Plan in accordance with 49 CFR Part 611. At this point, FTA will require, among other things, that the EIP be adopted or confirmed in the MPO's transportation plan. CATS will submit New Starts information to permit FTA rating of the fixed guideway project(s) in the EIP. Each element or operable segment determined to be part of the EIP will be rated and evaluated separately, or if the EIP is designated as a Program of Interrelated Projects in accordance with 49 CFR 5328(c), all elements of the EIP will be evaluated as a single project.

As a consequence, following the approval of each FEIS, CATS will be in a position to:

- Request a Record of Decision and seek approval to enter Final Design on those parts of the System Plan that were previously approved for PE, and

- Request a Record of Decision and proceed with right-of-way acquisition and other land actions to preserve and develop the remainder of each corridor.

1.3.3 Implementation

In the event CATS pursues federal funding, CATS and FTA will include review and discussion on the DEIS / DEA for elements of the 2025 Transit System Plan on the agenda of the CATS/FTA Quarterly Meetings. CATS will provide special briefings on System Plan implementation to FTA staff as needed.

1.4 Purposes of Project Management Plan

This Project Management Plan (PMP) is being developed to assist with the management of all elements of the CCSC program to assure consistency, facilitate quality control, and provide for receipt of local funding and possible federal capital assistance grants. This PMP was prepared to fulfill the requirements of FTA (Title 49 of the United States Code, Section 5327). It defines the scope of project implementation during Preliminary Engineering and sets the stage for further development for subsequent final design, right-of-way acquisition, and construction.

As described in the referenced section of the U.S. Code, Project Management Oversight, a PMP must include the following:

1. Adequate recipient staff organization with well-defined reporting relationships, statements of functional responsibilities, job descriptions, and job qualifications;

2. A budget covering the project management organization, appropriate consultants, property acquisition, utility relocation, systems demonstration staff, audits, and miscellaneous payments the recipient may be prepared to justify;
3. A construction schedule for the project;
4. A document control procedure and record-keeping system;
5. A change order procedure that includes a documented, systematic approach to the handling of construction change orders (will be developed as the Project progresses);
6. Organizational structures, management skills, and staffing levels required throughout the construction phase (will be developed as the Project progresses);
7. Quality control and quality assurance functions, procedures, and responsibilities for construction, system installation, and integration of system components (will be developed as the Project progresses);
8. Materials testing policies and procedures (will be developed as the Project progresses);
9. Internal plan implementation and reporting requirements;
10. Criteria and procedures to be used for testing the operational system or its major components (will be developed as the Project progresses);
11. Periodic updates of the plan, especially related to project budget and project schedule, financing, ridership estimates, and status of local efforts to enhance ridership where ridership estimates partly depend on the success of those efforts; and
12. The recipient's commitment to make monthly submissions on project budget and project schedule to the Administrator.

This PMP provides an overview of the management requirements and programs that are needed to satisfactorily implement an efficient and cost-effective rail transit system. This PMP will coordinate the schedule for implementation with budget considerations and develop plans for dealing with various challenges, including environmental, social, and other impacts. Because CATS has six rapid transit corridor projects, including the Center City / Streetcar Corridor, concurrently in the Conceptual Design phase, CATS has also developed a Corridor Program Management Plan to identify the framework for program-level management/reporting, decision-making, coordination, roles and responsibilities, administration, quality control, and document control.

1.5 Project Financing

The *CATS 2025 Adopted System Plan* projected a total cost of $181 million to design and build the streetcar network, including extensions. This cost assumes a 3.0% annual cost inflation and was based on a start of construction during a 1 to 10 year range, with Beatties Ford Road and Central Avenue extensions during years 10 to 15 and the downtown loop during years 15 to 25. This projection does not include the cost for construction of the Charlotte Multimodal Station, included along the streetcar alignment – a facility that is to be

separately funded by the various entities benefiting from the project. A Conceptual Design / Environmental Analysis is currently underway. This work will result in revised cost estimates based on more detailed analysis of the improvements required to upgrade roadway network to accommodate streetcar rails, evaluate at-grade rail crossings, incorporate system operational needs, and construct passenger and streetscape amenities.

The *CATS 2025 Adopted System Plan* assumes a funding breakout of 50% Federal, 25% State, and 25% Local/CATS sources. CATS may seek Section 5309 Federal New Start assistance for one-half (50 percent) of all capital costs, or some $90.5 million. Consistent with the policy of the North Carolina Department of Transportation, the balance of the capital requirement would be equally divided between the CATS sales tax proceeds and funding provided by the North Carolina Department of Transportation. The CATS sales tax has been collected since April 1999. The source of funding for the NCDOT share is the Transit Trust Fund created in 2001 by the North Carolina Legislature. CATS' current financial plans do not require long term debt financing. If debt financing is required to implement the Project, a number of instruments are available to the City of Charlotte that does not necessitate voter approval. The City of Charlotte enjoys an AAA credit rating.

1.5.1 Center City / Streetcar Corridor Capital Costs

The current, working estimate to complete the CCSC is $181 million. A line item breakdown is provided in **Table 1-1**.

Table 1-1
Charlotte Area Transit System
Center City / Streetcar Project
Engineer's Estimated Cost-to-Complete

Assumptions				
Annual Cost Inflation = CPI	3.0%			
Capital Costs (2002$)				
Trade Pedestrian/Streetscape		$25.0		
Trade Street Streetcar		$84.0	Streetcars =	6
Subtotal, 1st 10 Years		$109.0		
Subtotal, 10 - 15 Years		$0.0		
Streetcar Loop – 15 - 25 Years		$72.0	Streetcars =	4
Total Center City Program		$181.0	Streetcars =	10
Capital Funding Allocations				
Streetcar Lines				
	Trade Street	Loop		
Federal, FTA New Start	50.0%	50.0%		
State	25.0%	25.0%		
CATS	25.0%	25.0%		
	100.0%	100.0%		
Buildings				
Federal		50.0%	Assume to be Discretionary Bus or Intermodal	
State		0.0%		
CATS		50.0%		
		100.0%		

Streetscape	
Federal	50.0%
State	25.0%
City of Charlotte	0.0%
Special Assessment District	0.0%
CATS	25.0%
	100.0%

1.5.2 Center City / Streetcar Capital Revenues

The annual funding plan for the CCSC is shown in **Table 1-2**. Funding assumes Federal, State, and Local/CATS sources.

Table 1-2
Charlotte Area Transit
Center City / Streetcar Corridor Annual Capital Sources and Uses of Funds

Sources of Funds	**Prior**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Federal								
Streetcar		$0.0	$0.0	$1.6	$4.2	$20.3	$17.9	$5.2
Building		$0.0	$0.0	$0.0	$0.0	$0.6	$2.1	$4.3
Streetscape		$0.0	$0.0	$0.0	$0.0	$0.3	$0.9	$1.8
Total Sources		$0.0	$0.0	$1.6	$4.2	$21.2	$20.9	$11.4
Cumulative		***$0.0***	***$0.0***	***$1.6***	***$5.9***	***$27.0***	***$47.9***	***$59.3***
State								
Streetcar		$0.0	$0.0	$0.8	$2.1	$10.1	$9.0	$2.6
Building		$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Streetscape		$0.0	$0.0	$0.0	$0.0	$0.1	$0.4	$0.9
Total Sources		$0.0	$0.0	$0.8	$2.1	$10.3	$9.4	$3.5
Cumulative		***$0.0***	***$0.0***	***$0.8***	***$2.9***	***$13.2***	***$22.6***	***$26.2***
CATS								
Streetcar		$0.0	$0.0	$0.8	$2.1	$10.1	$9.0	$2.6
Building		$0.0	$0.0	$0.0	$0.0	$0.6	$2.1	$4.3
Streetscape		$0.0	$0.0	$0.0	$0.0	$0.1	$0.4	$0.9
Total Sources		$0.0	$0.0	$0.8	$2.1	$10.9	$11.5	$7.8
Cumulative		***$0.0***	***$0.0***	***$0.8***	***$2.9***	***$13.8***	***$25.3***	***$33.1***
Center City Partners								
Streetscape		$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Cumulative		***$0.0***	***$0.0***	***$0.0***	***$0.0***	***$0.0***	***$0.0***	***$0.0***
Total Cumulative - Inflated$		***$0.0***	***$0.0***	***$3.3***	***$11.7***	***$54.0***	***$95.8***	***$118.6***

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Federal								
Streetcar	$0.0	$0.0	$0.0	$0.0	$0.0			
Building	$7.6	$6.5	$4.0	$0.3	$0.0			
Streetscape	$3.2	$4.9	$4.0	$1.0	$0.0		-	
Total Sources	$10.8	$11.4	$8.1	$1.4	$0.0			
Cumulative	***$70.1***	***$81.5***	***$89.5***	***$90.9***	***$90.9***			
State								
Streetcar	$0.0	$0.0	$0.0	$0.0	$0.0			
Building	$0.0	$0.0	$0.0	$0.0	$0.0			
Streetscape	$1.6	$2.4	$2.0	$0.5	$0.0		-	
Total Sources	$1.6	$2.4	$2.0	$0.5	$0.0			
Cumulative	***$27.7***	***$30.2***	***$32.2***	***$32.7***	***$32.7***			
CATS								
Streetcar	$0.0	$0.0	$0.0	$0.0	$0.0			
Building	$7.6	$6.5	$4.0	$0.3	$0.0			
Streetscape	$1.6	$2.4	$2.0	$0.5	$0.0		-	
Total Sources	$9.2	$9.0	$6.0	$0.9	$0.0			

Cumulative	***$42.3***	***$51.3***	***$57.3***	***$58.2***	***$58.2***			
City/Special Assessment District								
Streetscape	$0.0	$0.0	$0.0	$0.0	$0.0			
Cumulative	***$0.0***	***$0.0***	***$0.0***	***$0.0***	***$0.0***			
Total Cumulative – Inflated$	***$140.1***	***$162.9***	***$179.1***	***$181.8***	***$181.8***			
	2018	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Federal								
Streetcar	$1.6	$4.1	$12.8	$39.5	$4.5			
Building	$0.0	$0.0	$0.0	$0.0	$0.0			
Streetscape	$0.0	$0.0	$0.0	$0.0	$0.0			
Total Sources	$1.6	$4.1	$12.8	$39.5	$4.5			
Cumulative	***$1.6***	***$5.7***	***$18.5***	***$58.0***	***$62.5***	***$62.5***	***$62.5***	***$62.5***
State								
Streetcar	$0.8	$2.1	$6.4	$19.7	$2.3			
Building	$0.0	$0.0	$0.0	$0.0	$0.0			
Streetscape	$0.0	$0.0	$0.0	$0.0	$0.0			
Total Sources	$0.8	$2.1	$6.4	$19.7	$2.3			
Cumulative	***$0.8***	***$2.9***	***$9.3***	***$29.0***	***$31.2***			
CATS								
Streetcar	$0.8	$2.1	$6.4	$19.7	$2.3			
Building	$0.0	$0.0	$0.0	$0.0	$0.0			
Streetscape	$0.0	$0.0	$0.0	$0.0	$0.0			
Total Sources	$0.8	$2.1	$6.4	$19.7	$2.3			
Cumulative	***$0.8***	***$2.9***	***$9.3***	***$29.0***	***$31.2***			
City/Special Assessment District								
Streetscape	$0.0	$0.0	$0.0	$0.0	$0.0			
Cumulative	***$0.0***	***$0.0***	***$0.0***	***$0.0***	***$0.0***			
Total Cumulative - Inflated$	***$3.2***	***$11.5***	***$37.0***	***$115.9***	***$124.9***			
	TOTAL							
Federal		Trade	Loop					
Streetcar	**$111.8**	$49.3	$62.5					
Building	**$25.5**							
Streetscape	**$16.2**							
Total Sources	**$153.4**	$153.4	50.0%					
Cumulative								
State		Trade	Loop					
Streetcar	**$55.9**	$24.6	$31.2					
Building	**$0.0**							
Streetscape	**$8.1**							
Total Sources	**$64.0**	$64.0	20.8%					
Cumulative								
CATS		Trade	Loop					
Streetcar	**$55.9**	$24.6	$31.2	$55.9				
Building	**$25.5**							
Streetscape	**$8.1**							
Total Sources	**$89.4**	$89.4	29.2%					
Cumulative								
City/Special Assessment District								
Streetscape	**$0.0**		0.0%					
Cumulative								
Total Cumulative - Inflated$	**$306.8**	$306.8	100.0%					

1.5.3 Federal Funds

The CCSC capital revenue plan assumes FTA Section 5309 New Starts share of 50%.

1.5.4 CATS Funds

The proposed federal grants will be matched by $45.25 million of CATS' funding derived from the ½ cent sales and use tax approved by the voters in 1998 and collected since April 1999. This dollar amount equals 25% of the total capital cost of the project. The tax is dedicated to funding public transportation in Mecklenburg County. In 2003, the CATS sales and use tax generated some $55 million.

1.5.5 State Funds

The CCSC capital revenue plan assumes a North Carolina state-funding match of $45.25 million, or 25% of total capital costs.

1.6 Project Schedule

A general project schedule has been developed to provide a basis for financial planning and to facilitate communication with the public. It assumes initial Streetcar operations commencing in September 2009. **Figure 1-2** illustrates the major activities and milestones of the Project as currently planned:

Figure 1-2 Project Schedule

ACTIVITY	DATE
Begin Conceptual Design	September 2004
Complete Conceptual Design	December 2005
Begin Preliminary Engineering	April 2005
Complete Final Design	December 2006
Begin Construction of Initial Alignment	July 2007
Complete Construction of Initial Alignment	June 2009
Complete Construction of Extensions	June 2017
Complete Construction of CBD Loop	June 2025
Complete All Work	**June 2025**

2 PROJECT ORGANIZATION AND MANAGEMENT

2.1 Organizational Strategy

As discussed in Section 1.3, the current organizational setup for transit in Charlotte-Mecklenburg places the public transportation system administratively within the City of Charlotte as a department doing business as CATS. Policy direction for CATS efforts to develop and operate transit is provided by the MTC composed of representatives from local governmental units in Mecklenburg County and from surrounding counties as well as NCDOT and SCDOT. This organizational setup is responsible for implementing the *2025 Integrated Transit/Land-Use Plan for Charlotte-Mecklenburg* using the one-half percent sales tax approved by the voters for transit system development and operation.

The organizational arrangement for CATS was primarily driven by two factors:

- The need to closely coordinate transit system development with local land use planning and development activities including zoning actions and infrastructure improvements. Several City departments, such as the Charlotte-Mecklenburg Planning Commission and the Charlotte-Mecklenburg Utilities Department have roles that extend beyond City boundaries. City employees also staff the Mecklenburg-Union Metropolitan Planning Organization (MUMPO).
- The need to involve the six towns and the County in the implementation of the transit/land use plan. The six towns control land use planning and zoning within town boundaries while the County administers zoning within unincorporated areas not controlled by Charlotte or the towns.

Along with this organizational arrangement for CATS, two additional considerations have helped drive the organizational strategy that will be used to plan and design rapid transit improvements in the five primary corridors and in Center City Charlotte:

- Create a System Planning organization that can direct concurrent planning and design efforts in multiple corridors and coordinate work among corridors and with other infrastructure projects and planning initiatives.
- Create a project organization for an individual corridor similar to the structure used for the South Corridor LRT project.

As a result, the organizational strategy for advancing the 2025 Transit System Plan is:

1) Decision-Making and Coordination

   a) Reinforce CATS' role as the agency and management responsible and accountable for implementation of the overall transit system program.
   b) Involve Key Business Executives (KBEs) from the City departments responsible for planning and zoning, engineering, and roadway planning and traffic management in making policy and programmatic decisions.
   c) Involve senior management from the aforementioned City departments in strategic planning and program monitoring.

d) Involve project managers for the individual corridor studies from the aforementioned departments in the coordination of analyses and documentation.
e) CATS will continue to use a Program Advisor consultant to assist with strategic planning and other activities occurring at the system level.
f) Coordinate at the system level with outside parties (as required for proper funding), such as:

    (a) Federal Transit Administration (FTA)
    (b) Federal Highway Administration (FHWA)
    (c) Regulatory and Resource Agencies
    (d) NCDOT
        (i) Project Development and Environmental Analysis
        (ii) Public Transportation
        (iii) Rail
        (iv) Financial and Grants
    (e) Private Railroads

2) Project Implementation Approach

a) Coordinate with NCDOT's Division 10 staff, as necessary.
b) Coordinate at the corridor level with local jurisdictions located in the corridor.
c) Architectural/engineering consulting firms with subcontractors will be used to provide engineering, environmental and design services for the individual corridors.

3) Staffing Approach

As described in section 2.3.1 below, the City / CATS will hire qualified and experienced staff for positions appropriate to perform the activities for each phase of program and project development supplemented by consultants to perform certain specialized tasks.

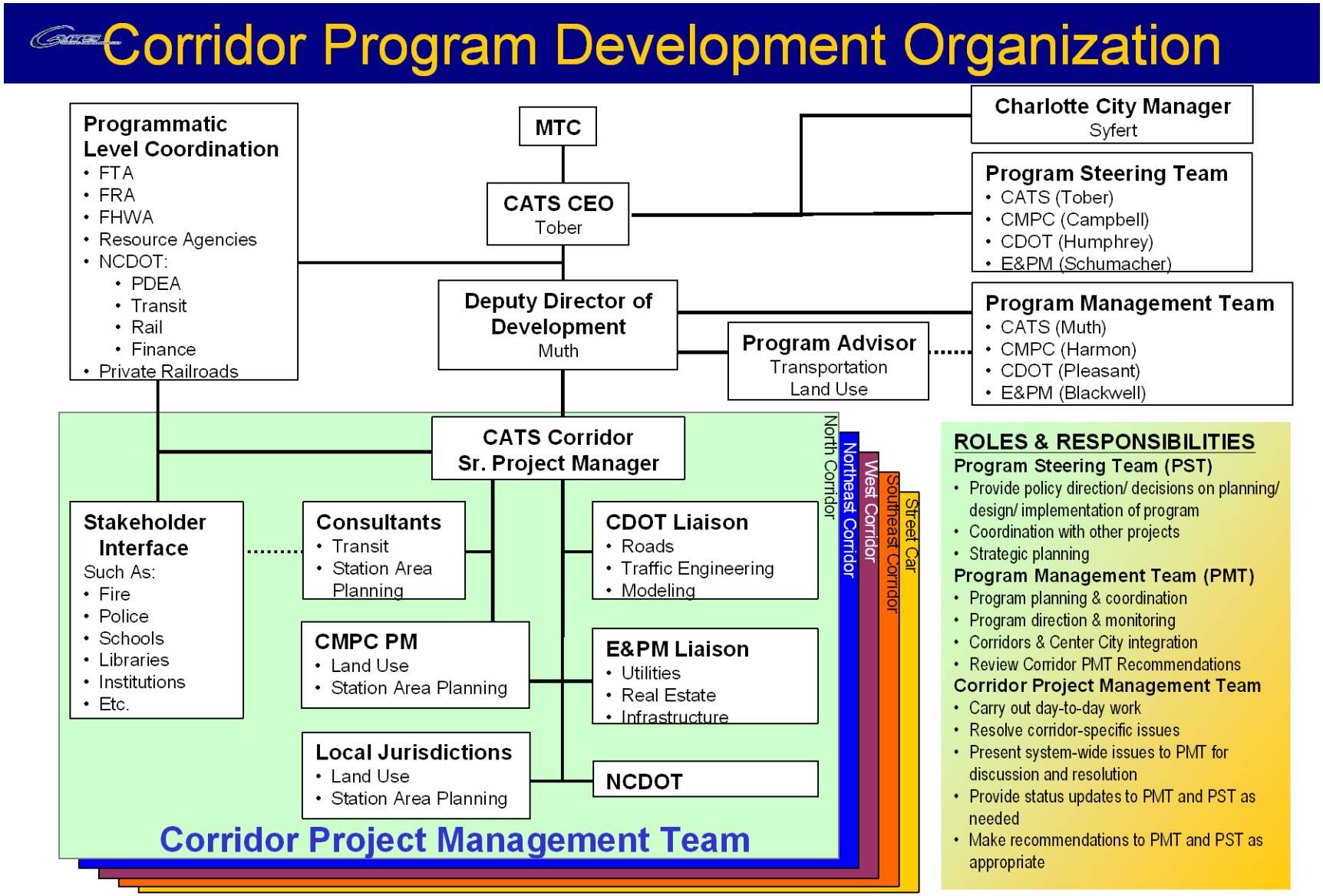
2.2 Management Approach

Because planning and design work will be done concurrently in the Southeast, West, North, Northeast, and Center City, CATS has developed an organization structure to manage and coordinate these efforts at a system level. A broader organizational framework also encourages the involvement of other key City departments in making policy and programmatic decisions and ensures coordination of work among the individual corridors. **Figure 2-1** shows the organization at the program level.

This integrated and coordinated approach brings all the key parties within the City to the table. The System Plan Development Organization has three key components.

1. At the policy level, a **Program Steering Team ("PST")** has been established. The PST will take broad City and Metropolitan Transit Commission ("MTC") policy and direction to develop decisions on planning, design, and implementation of the CATS rapid transit program.

Figure 2-1: Program Level Organization Chart



2. A **Program Management Team ("PMT")** has been established to provide program direction and coordination to the individual corridor teams.

3. To provide day-to-day coordination and management of the Project and the consultant team, a **Corridor Management Team ("CMT")** has been established.

These integrated management teams include representatives from four key City departments – CATS, Engineering and Property Management, Charlotte-Mecklenburg Planning Commission, and Charlotte Department of Transportation. This management approach allows for proactive coordination between the various City departments that need to be involved in the implementation of the transit project. As an integrated team, all agencies / departments concerned will have an active role in the decision-making process, ensuring a coordinated transit program that is consistent with other city-county plans and programs.

2.2.1 Program Steering Team

The Project Steering Team ("PST") is composed of the Key Business Executives ("KBEs", ie Department heads) from CATS, the City of Charlotte Engineering and Property Management ("E/PM") Department, Charlotte-Mecklenburg Planning Commission ("CMPC"), and the Charlotte Department of Transportation ("CDOT"). This committee makes major policy and programming decisions that have system, City, or regional implications. The PST is expected to meet quarterly. The CATS Deputy Director for Development ("DDD") will keep records of the KBEs' decisions and discussions.

2.2.2 Program Management Team

The Program Management Team ("PMT") includes the DDD of CATS and the Assistant Directors / Managers from CMPC, CDOT, and E/PM departments. The CATS DDD will chair regular meetings of this committee and be responsible for maintaining records of decisions and discussions. This group is responsible for strategic planning and monitoring of the overall system planning effort. The group also will ensure integration of corridor planning with work undertaken in Center City Charlotte.

The PMT will analyze and resolve any detailed planning, environmental, and design issues arising from corridor work. The PMT is the primary body for coordination of planning activities related to project analysis and documentation and makes recommendations on decisions that the PST must make.

2.3 Project Organizational Structure

The Center City / Streetcar Corridor project organization has the following characteristics:

- The CATS CEO, Ron Tober, is the public official responsible and accountable for implementation of the project in accordance with Federal and State requirements and sound management practices. The CATS Chief Executive Officer reports administratively to the City Manager and receives policy direction from the MTC.

- The CATS Deputy Director of Development ("DDD"), John Muth, is responsible for overseeing the development and implementation of the Corridor Program. He is responsible for ensuring the coordination of the corridor projects and working with other City departments to monitor the corridor system planning effort. The CATS DDD reports to the CATS CEO.

- The CATS Senior Project Manager ("SPM"), Willie Noble, is delegated the responsibilities for the day-to-day management and control of the Center City / Streetcar Corridor project. The Senior Project Manager reports to the CATS DDD.

- The SPM will oversee and direct the work of the transit consultants retained to plan and design the corridor project. He will work with the Corridor Project manager from CMPC staff who will oversee the technical work of the Corridor Station Area Planning Consultant.

- The SPM or representatives from E/PM, CMPC staff, and CDOT will be responsible for coordinating activities in their area of expertise with their counterparts in other jurisdictions in the corridor and with NCDOT's Division 10 staff.

- The CATS SPM will oversee and direct the work of CATS staff assigned to the project. He will coordinate with staff in other City departments working on the corridor project, most notably E/PM, CMPC, and CDOT. The CATS SPM will be the primary interface between the project and other stakeholders.

2.3.1 Staffing Approach

CATS has planned for project-related staffing additions to support the current Conceptual Design / Environmental Assessment phase, the Preliminary Engineering, and Continuing PE (CPE) efforts. Identified staff positions for the Conceptual Design / EA phase are shown in **Table 2-1**. Positions for future phases will be added in future phases of the PMP. While some of those future positions will be administratively housed in other departments (e.g., the Engineering and Property Control department – E/PM), each position will be fully dedicated to the project, and report functionally to the CATS Project Director. Project staff will be supplemented by consultant support.

To complete the Conceptual Design effort, CATS will be contracting with a national consulting firm to assist in the development of a Quality Assurance / Quality Control Plan.

Table 2-1
Near-Term Project Staffing Plan

Title	Status	Role	Department
Sr. Project Manager	Filled in 2004	Management of CCSC program	CATS
Ass't Proj. Manager	Filled in 2004	Secondarily responsible for management of the CCSC program	CATS
Transportation Planner II	To be filled in FY'05		CATS
Public Information Technician	Filled in FY'05	Support Public Involvement Program	CATS

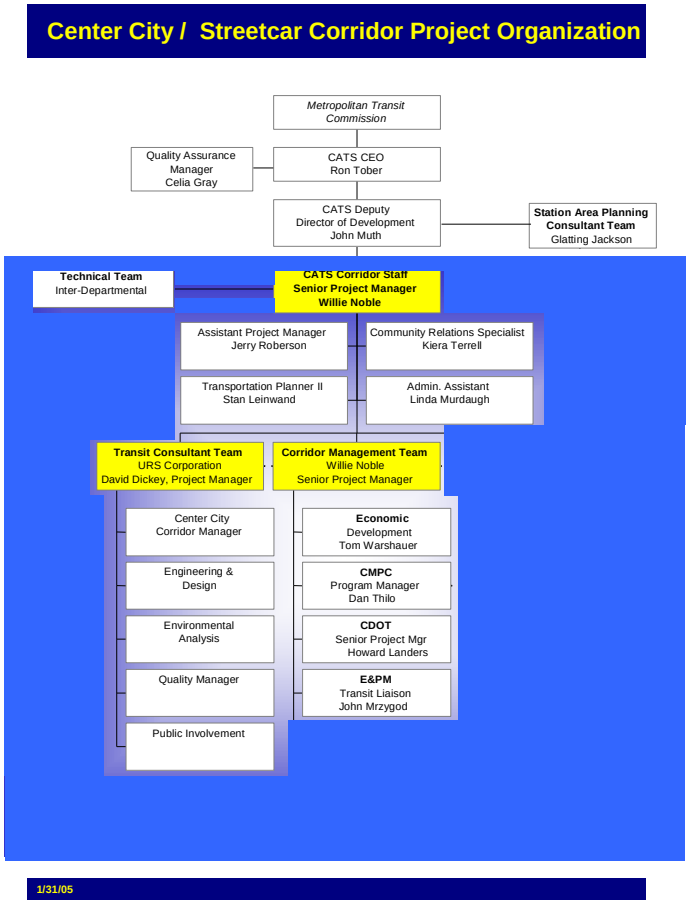
Office Assistant	Filled in FY'05	Staff support and document control	CATS
Sr. Transit Systems Engineer	To be filled in FY'07		CATS
Construction Manager	To be filled in FY'07		CATS
Sr. Transit Engineer	To be filled in FY'07		CATS
Office Administrator	To be filled in FY'07		

2.3.2 Corridor Management Team

The Corridor Management Team (CMT) will coordinate and manage the EIS/EA process for the Streetcar Corridor. The CMT, as shown in **Figure 2-2**, consists of the CATS Senior Project Manager, E/PM Engineer, CMPC representation, CDOT Transportation Planner, and City of Charlotte Economic Development staff.

The leader of the CMT is the CATS Senior Project Manager. The Senior Project Manager is responsible for all day-to-day activities associated with the Project, and reports directly to the Program Management Team. The other members of the CMT support the Project Manager.

Figure 2-2: Corridor Management Team



2.4 Delegation of Authority

2.4.1 Financial Authority

The City's standard financial authority shall be a part of the management control of the *2025 Transit System Plan*. The authority limits are shown in **Table 2-2**. Any dollar amount above the limits shown will require City Council action.

Table 2-2
Delegated Financial Authority

Approval Authority	Dollar($) limit
Senior Project Manager	Defined in Contract
Chief Development Officer	$25,000
CATS CEO	$50,000
City Manager	$100,000

2.5 Overall Roles and Responsibilities

Within the organizational structure for the Corridor System Plan and corridor projects, various individuals, consultants, and organizational units will have specific roles and responsibilities to perform. These roles and responsibilities will vary according to level of involvement and responsibility and by phase. **Figure 2-3** presents in matrix format the respective roles and responsibilities for the individuals, consultants and organizational units, including the PMT and PST, through the Conceptual Design phase of project development.

Figure 2-3: Responsibility Matrix

Responsibility Codes	Key Personnel / Organizations		
P – Primary responsibility	1. Program Steering Team	8. CATS Chief Cont. Officer	15. A/E Consultant
C – Contributor/support	2. Program Mgmt. Team	9. CATS QA Manager	16. Program Advisor Consultant
R – Reviewer/comment	3. CATS Chief Exec Officer	10. E/PM Manager.	17. NCDOT
S – Sign-off/approval	4. CATS Dep. Dir. For Dev.	11. Land Use Project Mgr.	18. Const. Mgmt. Consultants
Note: Not all key personnel/organizations have identified roles at this stage but will in later stages.	5. CATS Chief Ops. Officer	12. Real Estate Manager	19. Legal Counsel
	6. CATS Project Managers	13. CDOT Staff	
	7. CATS CFO	14. Corridor Mgmt Team	

	Key Personnel / Organizations																		
Project Tasks/Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Planning and Preliminary Design																			
Design Criteria	R	R	S	R	R	P					R		C	R	C	R	S		
System-level Service Plan	R	R	S	P	CR	CR					R		C	R	C	C			
Transit Alignment	S	R	R	R	R	P					C			C	C		C		
Stop Location and Configuration	S	R	R	R	R	P					C			C	C		C		
Right-of-way Design	S	R	R	R	R	P					C			R	C		S		
Corridor Operating Plan	R	R	S	R	CR	P					C			R	C				
Vehicle Specifications	R	R	S	R	R	P								R	C				
Maintenance Facilities Design		R	S	R	CR	P								R	C				
Ridership Estimates	R	C	S	R		CR					C		P	R	CR		CR		
Corridor Land Use Plans	S	R		R		CR					P		C	R	CR				
Corridor Infrastructure Plans	S	R		R		P				P			C	R	CR				
Performance Specifications			R	R	R	S								R	P	R			
Value Engineering	S	R	R	R	R	S				P				R	C	C	C		
														R					
EIS/EA Preparation	S	R	S	R	R	P					C	C	C	C	C	R	S	C	R
Corridor System Plan Update																			
Overall & Implementation Plan	S	R	S	P	R	C	R								C	C			
Financial Plan	S	R	S	R	R	C	P								C	C			
Peer Review	R	R	R	S		C	R	R	R					C	P			C	

Responsibility Codes	Key Personnel / Organizations		
P – Primary responsibility	1. Program Steering Team	8. CATS Chief Cont. Officer	15. A/E Consultant
C – Contributor/support	2. Program Mgmt. Team	9. CATS QA Manager	16. Program Advisor Consultant
R – Reviewer/comment	3. CATS Chief Exec Officer	10. E/PM Mgr.	17. NCDOT
S – Sign-off/approval	4. CATS Dep. Dir. For Dev.	11. Land Use Project Mgr.	18. Const. Mgmt. Consultants
Note: Not all key personnel/organizations have identified roles at this stage but will in later stages.	5. CATS Chief Ops. Officer	12. Real Estate Manager	19. Legal Counsel
	6. CATS Project Managers	13. CDOT Staff	
	7. CATS CFO	14. Corridor Mgmt Team	

Project Tasks/Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Project Administration																			
Project Budget	S	R	R	P		C								C	C		C	C	
Financial Management	S	C	C	C		C	P								C				
Project Schedule	S	R	R	P		C	R							C	C	C	C	C	C
Organizational Planning	S	P	P	C	C	C	R	R	R						C				
Project Control	R			P		C	R		R						C				
Public Information / Relations	C	C	C	P		C			C		C	C		C	C			C	
Project Tasks/Activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
FTA Coordination	P	C	C	P	C	C									C		C		C
Procurement	S	C	C	C		P		P						C	C				C
Contract Administration		C	C	C		P		P						C	C				C
Daily Consultant Oversight	R	R		P	C	P	C												
Reporting	R	R		P	C	P	CR					C		C	C				C
Quality Assurance Program																			
Quality Assurance	P	R		C		C	P		P									P	
Quality Control	C			C		C	R								P			P	
Document Control	S			C		C	P		S			C			C	C		C	R

2.6 Consultant Roles and Responsibilities

2.6.1 Conceptual Design and Final Design Phases

As part of the usual means of developing the design for Capital Projects, the City, through CATS has employed the professional services of an engineering and architectural team (Conceptual Design consultant). This team will provide detailed engineering and related services for the development of the necessary plans and documents for the Conceptual Design phase of the project.

The roles and responsibilities of the consultant include the following engineering and related technical services:

- Project Management and Coordination
- Public and Agency Involvement
- Preliminary Engineering
- Station Site Planning and Design
- Operations Planning and Final Ridership Revenue
- Preparation of Environmental Studies
- Preliminary and Final Draft EA and Final EA

The Conceptual Design consultant will prepare a Project Operation Plan (POP) that details how it will implement and manage the design and related services in accordance with the needs of this PMP. The POP will be reviewed by CATS for acceptance.

2.6.2 Final Design Phase

The present CATS plan for final design is to continue to utilize the services of the current consultant to prepare the final design documents, with CATS providing overall management direction. A detailed Final Design approach will be developed later in PE. The detailed approach will be incorporated into section 12, Final Design Approach, of this PMP.

The consultant responsibilities may include the following:

- Design Management and Coordination
- Preparation of final design documents
- Cost estimates and construction budget
- Schedules for design and construction
- Preparation of Construction Management services requirements

2.6.3 Construction Management Phase

CATS has not determined if it will utilize the Conceptual Design consultant for Construction Management or hire a separate firm. In either case, CATS and the City will provide overall management and direction, see Figure 2.1 for additional details. During the final design phase CATS will develop the needed Construction Management services requirements and up date Section 14, Construction Management of this PMP.

The CM responsibilities may include the following:

- Project management
- Preparation of R E and inspection procedures
- Construction administration and oversight
- Construction Document control and management
- On site inspection and acceptance of the work
- Change control
- Schedule monitoring and control
- Testing and Start up
- Project completion and close out

2.6.4 Policies Implementation

The policies and guidelines contained within this PMP will be utilized by the Program Management Team (PMT) in providing the Conceptual Design consultant with direction in the meaning and intent of the project policies. When additional clarification is needed the PMT will in a proactive manner work with the PST to determine the necessary action/guidance for the Conceptual Design consultant.

2.6.5 Procedure Development

The Conceptual Design consultant is tasked with the responsibility for the development and implementation of the required procedures in support of the various policies contained within this PMP and the City of Charlotte rules and regulations. This includes but is not limited to the following:

- ***Master schedule development***, based on the milestone schedule in Section 3.
- ***A&E Quality Assurance Plan*** (QAP) in accordance with FTA guidelines and CATS needs; plan developed by A&E consultant for A&E work.
- ***EA*** documents and reports in accordance with current FTA requirements
- ***Construction Costs estimate*** including methodology.
- ***A&E Document control system*** meeting project requirements; system developed by A&E consultant for A&E work.

3 PROJECT ADMINISTRATION AND CONTROL

3.1 Scope Control

The management team will implement procedures to manage the scope of the program to minimize increases in project or consultant costs. The specific procedure for controlling consultant cost overruns is defined on page 6 of City Contract No. 05-227, between the City and URS. Scope changes outside the $5,012,795 identified in the contract shall follow the City's existing financial guidelines as outlined in Section 2.4.1.

3.2 Cost Control

3.2.1 Control Process

The management of Cost and Budget Control will be performed through the use of existing and/or upgraded PC-driven software to compare projected revenues and expenses with actual revenues and expenses. Control of capital costs is vital to the success of this project due to the limited funding available and the desire to maximize public credibility. CATS operates under annual budgets with a fiscal period from July 1 to June 30. Annual project costs as well as total project budgets must remain within the CATS funding limits.

3.2.2 Conceptual Design Budget

The Conceptual Design budget consists of two components – Total Labor Costs and Total Direct Expenses. The first component is as defined in City Contract No. 05-227, between the City and URS, includes $4,565,772.16 for hourly and unit price services. The second component includes $437,100 for direct expenses. These elements combine to create a total budget of $5,002,872.16.

3.2.3 Preliminary Engineering

After completion of Conceptual Design (DEIS/DEA), it is anticipated that CATS will seek FTA approval to enter Preliminary Engineering ("PE") for the initial operating segment of the Center City / Streetcar Corridor project.

3.2.4 Final Design

Budgets will be established during PE for Final Design and for Construction Management. These budgets will be based on comprehensive cost estimates for the Project, estimates of available financial resources, and schedule. They will form the basis of a Full Funding Grant Agreement ("FFGA") with FTA. See Sections 1.5.1, 2.2, and 2.3 for additional information on Final Design approach and budget.

3.2.5. Construction

See Section 1.5.1, 2.2, and 2.3 for additional information on Construction approach and budget.

3.2.6 Contingency and Project Reserve

The project budget has been developed to include both a project reserve and line item contingencies.

The Project Reserve is the line item reserved for unanticipated and unknown costs (work items) on a project wide basis. As the project design develops, the project reserve will be adjusted to reflect design progress.

Contingency (construction) allowance has been allocated to individual line items (See Table 1-1 for project cost breakdown). The percentage assigned to each line item is based on the design progress and the engineer's judgment. As with the reserve, the contingency allowance will be adjusted and refined as the design progresses.

3.2.7 Financial Receipts and Disbursements

3.2.7.1 Invoicing Procedures

Invoicing by the consultant for Conceptual Design works follows a monthly cycle. Direct labor costs, subconsultant invoices and other direct Project costs are accumulated by the consultant's accounting system and assigned to cost control categories that conform to the work breakdown structure and contract budget. Invoices to the City are presented in a format prescribed by the City, which specifies for each work task:

- Contract budget amount
- Previously invoiced amount
- Current invoice amount
- Total invoiced amount

Current invoice amounts are detailed further, as follows:

- Direct labor cost, actual
- Overhead cost, based on a recent audited rate
- Fee for profit, computed as the contract fixed fee multiplied by percent complete
- Subconsultant costs, supported by copies of subconsultant invoices as approved by the prime consultant
- Other direct costs, supported by receipts or charge records
- General and administrative (G&A) fee, computed as subconsultant and other direct costs multiplied by the contract G&A percentage rate

The overhead rate used in invoices is a provisional rate based on a recent audit and is subject to adjustment at the completion of the contract to conform to actual rates as applicable over time.

Subconsultant invoices generally follow the same format as the prime consultant's invoice. However, because subconsultant work is controlled by work orders that allow latitude in the basis for payment (for example, cost-plus-fee, specific rates, lump sum), invoice forms may be slightly different. Subconsultant invoices are reviewed for personnel time charged, reasonableness of costs, compliance with Work Order terms, and general accuracy before being approved for recording in the prime consultant's accounting system.

3.2.7.2 Payment Procedures

Invoices for Project work received by CATS are reviewed and approved by the Project Director and Deputy Director of Development and forwarded to the CATS' Administration Manager for payment. The CATS' Administration Manager or her designee reviews invoices for compliance with contract terms, project budget, available funds, and general accuracy prior to final approval. CATS relies on the prime consultant to perform similar reviews of subconsultant invoices, considering subconsultant invoices to be certified as to accuracy and reasonableness if they are submitted to CATS for payment.

3.2.8 Financial Audits

The basis of payment to the contractor (consultant) for services rendered under cost-plus contracts is accounts of actual costs maintained by the contractor. Such contracts require the contractor to employ an accounting system to identify compensable costs, including overhead costs, and to certify that charges for which compensation is sought are appropriate, true, and accurate. Overhead charges are required to be based on rates audited by or for the contractor in accordance with acceptable accounting practices conforming to Federal Acquisition Regulations. The City of Charlotte relies on such accounting and audits in making payment for goods and services received. The City and its benefactor federal and state agencies, in particular FTA, reserve the right to conduct their own audits of contractor financial records to verify the appropriateness of charges. Audits may be performed and payment adjustments made during or following conclusion of any given contract.

3.3 Schedule Control

The establishment of a detailed baseline schedule with milestones is essential to maintaining control of the project schedule. The Master Schedule approach is presented below.

3.3.1 Milestone Matrix

The milestone matrix will be developed by the Conceptual Design consultant in the coming months.

3.3.2 Project *Master Schedule*

3.3.2.1 Conceptual Design Phase

The Conceptual Design consultant will be responsible for the development of the project master schedule. The schedule will be created and maintained using Primavera software and will have the following goals:

- Accurate tracking of progress
- Critical path
- Resource allocation
- Task based per the consultants scope of work
- Provide accurate information on project tasks, phases and milestones

The Master Schedule dates, durations and milestones will be based on the major milestones (section 3.3.1) and the preliminary engineering and environmental requirements stated in Section 4.0.

The Master Schedule will be developed using the Critical Path Method (CPM). The schedule will establish activity definitions, duration, relationships, key milestones and contract interfaces.

The Conceptual Design consultant will update the Master Schedule monthly. The current schedule will be submitted as part of the monthly consultant progress report. The Master Schedule, configuration and details will be subject to review and approval by the PMT.

3.3.2.2 Final Design

CATS with assistance from the Conceptual Design consultant will develop a schedule similar to that developed for the Conceptual Design phase prior to initiating Final Design.

3.3.2.3 Construction

The Master Construction schedule will include the following elements:

- Integrations of all critical construction activities
- Requirement for contractor to provide cost loaded schedule
- State and completion of major activities
- Interim completion of critical milestones
- Require a short look-ahead schedule (4-6 weeks)
- Be of sufficient detail to allow for effective measurement of progress and payments

3.3.3 Scheduling Process

The Master Schedule is the official Project Schedule, a summary schedule for the total Project to which the schedules for various Project components must conform. The Conceptual Design consultant will develop a Master Schedule that will be reviewed and accepted by the SPM, the CMT, and the DDD. The Master Schedule was devised at a summary level, identifying major project development stages, estimating their durations, identifying major milestones, determining logical sequence relationships among the activities and milestones, and recording this information in graphical form on a time scale.

3.3.4 Schedule Development

The Master Schedule developed near the outset of Conceptual Design work will be based primarily on work phases for the Project as a whole. Some ‘section' breakdown will be provided for certain major construction and procurement elements. Generally, however, schedule refinements for line and station elements and systems elements will occur in later stages of Preliminary Engineering.

The Conceptual Design consultant will maintain the Master Schedule. It will be used as a standard of comparison for reporting progress. During preliminary engineering, final design, and construction, more detailed Working and Contractor schedules will be developed, and, from time to time, summarized (“rolled up”) to produce a new version of the Master

Schedule. No changes will be made to the Master Schedule without a detailed and CATS approved rational to support the change. The working and detailed schedules will be based on the overall project Master Schedule; these stated schedules would be utilized to manage and control the project's progress.

3.3.5 Schedule Concurrence

The procedure for adopting changes to the Master Schedule begins with a recommendation by the Conceptual Design consultant and continues with reviews by the Project Management Team. With concurrence by the PST, the Master Schedule will be revised to incorporate the latest approved schedule information.

3.3.6 Status and Updates

During Conceptual Design, Project schedules will be updated as significant changes are made to the Project Working Schedules database. During final design and construction, Project schedules will be reviewed and updated on a more regular basis, possibly monthly.

3.4 Policy Guidelines

In fulfilling their responsibilities, the PST and PMT will use as applicable the following KBU guidelines, codes and standards:

3.4.1 Charlotte-Mecklenburg Planning Commission (CMPC)

CMPC's primary role in the Center City / Streetcar Corridor Project is to develop streetcar stop plans and policies, and to ensure that development in and around streetcar stops is consistent with CMPC policies and the neighboring small area plans. In accomplishing this, CMPC staff will rely on a number of plans and policies, including but not limited to:

General:

- Centers and Corridors Plan
- 2025 Integrated Transit and Land Use Plan
- Center City 2010 Vision Plan
- Smart Growth Principles
- Transit Station Area Principles
- General Development Policies
- City of Charlotte Zoning Ordinances
- South End/Uptown Rail Corridor Plan
- Urban Street Design Guidelines

Center City / Streetcar Corridor:

- East District Plan
- Eastside Strategy Plan
- Center City Transportation Plan
- Plaza / Central PedScape Plan
- Sunnyside PedScape Plan
- West End PedScape Plan
- Eastland Area Plan

3.4.2 Charlotte Department of Transportation (CDOT)

CDOT is responsible for travel-demand modeling for the City of Charlotte and the Mecklenburg-Union MPO. CDOT is in the process of developing a regional model using TransCAD software. The new regional model will be used for upcoming travel projections, including those for the Center City / Streetcar Corridor Conceptual Design.

CDOT will use the *Manual Of Uniform Traffic Control Devices, Millennium Edition*, for review of traffic impact studies.

3.4.3 Engineering and Property Management (E/PM)

E/PM's primary role is to provide support to CATS for real estate acquisition and to coordinate city infrastructure projects with the corridor transit projects.

3.4.4 CATS

CATS has developed a number of internal policies that are consistent with existing City and State requirements, and reflect the agency's need to comply with Federal requirements. These policies and procedures are contained in CATS *Policy and Procedure Manual*. Other relevant CATS manuals and plans may also be used by Project Management staff, including the previously referenced Corridor Program Management Plan.

Federal guidance, policies and procedures utilized by CATS Project Management staff include, but are not limited to the following:

- Federal Transit Administration, *Advancing Major Investments through Planning and Project Development*, January 2003.
- Federal Transit Administration, *Quality Assurance and Quality Control Guidelines*, February 2002
- Federal Transit Administration, *Project and Construction Management Guidelines*, 2003 Update
- Federal Transit Administration, *Reporting Instruction for the Section 5309 New Starts Criteria*, most recent

In cases where a listed document and a Project Management Plan requirement are different, the more stringent requirement will be used. In such cases, the differences will be brought to the attention of the Project Manager. The Project Manager with appropriate consultation of CATS DDD, CMT, and/or PMT will provide written direction as to which requirement will be used.

In the absence of an existing guideline, code, or standard, the SPM, with appropriate consultation of the CATS DDD and the PMT, will provide written direction on how to proceed.

4 ENVIRONMENTAL IMPACT STATEMENT / ENV. ASSESSMENT

4.1 Bases of Design

4.1.1 Design Guidelines

Design guidelines developed during the Conceptual Design phase established a design philosophy to guide the planning and engineering of facilities and the development of performance specifications. These guidelines are the basis for the planning and conceptual design of the early EIS/EA tasks. The design criteria and performance specifications will be developed by the Conceptual Design consultant to provide greater detail for the final design effort. Further refinements are expected to continue through final design as well.

These design guidelines are intended to respond to the following project goals:

- Focus growth and development
- Minimize negative environmental impacts
- Improve mobility
- Provide cost-effective transit investment
- Sustain economic development

4.1.2 Codes and Standards

The conceptual engineering and environmental studies work will be conducted in accordance with all applicable laws and regulations. The Conceptual Design consultant will develop applicable standards and code requirements for review and approval by the Corridor Management Team and Program Management Team. Each chapter will contain a codes, standards, and guidelines section for the particular discipline.

Technical procedures for environmental studies will be developed in accordance with applicable federal and state requirements including those outlined in the National Environmental Policy Act. Planning studies will be conducted to yield information as customarily required by such agencies for applications and reviews.

4.2 Consultant Team Scope of Services

Appendix C contains the Conceptual Design consultant team's scope of services.

4.3 Performance Control

Performance control for planning, preliminary engineering and technical analyses during the PE/FEIS/FEA stage will be accomplished by employing personnel experienced in the assigned tasks, directing and monitoring through a hierarchy of supervisors, and conducting comprehensive system reviews at key junctures.

4.3.1 Planning, Design, and Analysis

CATS has retained a team of consultant firms to conduct conceptual design, including DEIS/DEA, and is headed by a prime consultant, URS, which has assembled a number of sub-consultant firms specializing in the full range of disciplines required to conduct work

detailed in the scope, such as roadway design, urban design, environmental studies, and supportive analyses. An organizational chart and resumes of key consultant staff are provided in **Appendix D**.

URS is responsible for all work conducted by the consultant team, including its sub-consultants. While the lines of authority and accountability for work has been rigidly established to minimize confusion and disputes, the DEIS/DEA work is being conducted with considerable communication and interaction among the various consultant firms, their employees, and the PMT and CMT.

The Conceptual Design consultant team will be structured by discipline with a hierarchy of key personnel responsible for each discipline. The consultant Project Manager and Corridor Managers work together to coordinate team efforts, to provide direction for various tasks, and to oversee and review work activities and products for compliance with Project requirements.

4.3.2 Quality Assurance and Control

The purpose of Quality Assurance and Quality Control for the EIS/EA phase of the Project is to assure that planning, design, and engineering work is performed in accordance with established engineering criteria and City of Charlotte / CATS requirements. This section sets forth the requirements for planning, implementing, and evaluating an effective Quality Assurance Program. These requirements provide appropriate controls for planning and design and will enable CATS CEO and DDD to be confident that engineering and environmental work for the Center City / Streetcar Corridor project will be carried out in such a way as to ensure a high quality product.

Quality Assurance and Quality Control are defined as follows:

> ***Quality Assurance (QA)*** – All those planned and systematic actions necessary to provide adequate confidence that an item is in conformance with established requirements and will satisfy given needs; the activity of providing the evidence needed to establish confidence that quality functions are being performed adequately. QA is a *management* tool.
>
> ***Quality Control (QC)*** – The operational techniques and activities that are used to ensure that a product or service fulfills requirements for quality. Generally, QC refers to the professional preparation and checking of design documents; inspecting, measuring, and testing a process or product to determine that it meets specifications; and documentation of those activities. Products include design documents, manufactured equipment, or constructed items. QC is a *production* tool.

QA and QC are described in further detail in Section 5.0.

4.4 Project Reviews

At certain junctures during Project development, comprehensive reviews will be made of the system as a whole. Three types of review—in-progress and peer reviews and value engineering—follow prescribed formats and procedures to yield an overall project evaluation

by disinterested parties who are experienced in transit systems development and transit systems operation.

4.4.1 In-progress Review (Milestones)

CATS will conduct detailed program reviews on all major deliverables. The Conceptual Design consultant will be required to prepare draft and final versions of major deliverables for review and acceptance by Charlotte Area Transit System. The Conceptual Design consultant and the CATS Project Director will mutually agree on additional in-progress submissions, based on the Conceptual Design deliverable listing, per Section 4.6 of this document.

The Conceptual Design consultant will be required to make design submittals at the 10% to 15% level.

4.4.2 Peer Review

Under the direction of the CMT, the Conceptual Design consultant team will assemble a group of individuals from the staffs of agencies currently providing streetcar service similar in nature and scale to that intended for the Project. Collectively, the group will be experienced in all aspects of streetcar transit facilities design and operations, but otherwise will not be associated with the Project. The group will be convened for two to three days at critical junctures to review Project plans and designs, to share relevant perspectives and experiences with the City of Charlotte / CATS, and to offer suggestions for improving the program.

The first Peer Review will be scheduled near completion of the DEIS/DEA. The peer group will be provided with a briefing package presenting background information and current plans in advance of the review. Select project and consultant staff will attend the review session to provide information as requested by the reviewers and to record observations and recommendations. The second Peer Review will be scheduled for near the completion of the FEIS/FEA.

4.4.3 Value Engineering

Value Engineering (VE), as defined in FTA C5010.1C, is a process of systematically applying standardized techniques to review designs, products, or services and to identify improvements, and means to achieve them, that will achieve the desired program functions at the lowest possible life cycle cost. By definition, any modifications resulting from the VE process must be consistent with established requirements for performance, maintainability, quality, safety, and community impacts.

VE exercises will be performed at the conclusion of the PE phase. Certified Value Specialists (CVS) will be employed to design and conduct the sessions. The VE sessions will include technical representatives from oversight agencies, the City of Charlotte, independent team members, and appropriate members of the Conceptual Design consultant team. The sessions will produce recommendations to reduce costs and to improve the effectiveness of the proposed streetcar system.

4.4.4 Value Engineering Process

At the end of the PE phase, a formal, forty-hour Value Engineering workshop will be conducted through the following approach endorsed by the Society of American Value Engineers (SAVE).

1. Pre Coordination Workshop - The VE Coordination (VETC) will collect the drawings and specifications and review information. The VETC will make arrangements for the study including logistics and participants scheduling. The Conceptual Design consultant will supply the participants with copies of the drawings, background reports, detailed cost estimates and other design documents.
2. Orientation with the Design Team – Part of first workshop session with design rational presented to the VE team by the Project Director with support from the Conceptual Design consultant
3. VE Team will conduct the VE Exercise
4. Following the VE workshop sessions, the VETC will present an oral presentation of the team's findings to CATS, to be followed by a written report within two weeks
5. The CATS Project Director with assistance from the Project Management Team and support from the Conceptual Design consultant will evaluate each VE recommendation and provide the Project Steering Team with recommendations as to acceptance or rejection for each VE recommendation
6. Accepted recommendations will be incorporated into the design and CATS will provide FTA with a report on the accepted recommendations.

4.4.5 System Safety

Preliminary Hazard Analysis (PHA)

- The Conceptual Design consultant will prepare a Preliminary Hazard Analysis (PHA) during the Preliminary Engineering phase. The PHA will identify major hazards and their implications on safety of the light rail system, and develop an approach for controlling the hazard.

System Safety Analysis

A formal system safety analysis will be conducted during Final Design.

4.4.6 Bus and Rail Fleet Management Plans

A Bus Fleet Management Plan and Light Rail Fleet Management Plan, if applicable, will be updated during the Preliminary Engineering phase. The Bus Fleet Management Plan was prepared by the CATS Operations Division and includes information on current system operating practices, service, and vehicle demand. The Plan defines the current vehicle maintenance program for preventive maintenance, vehicle servicing, replacement, expansion requirements, and road calls. It also defines future vehicle, facility, and staffing needs related to proposed service improvements and expansion.

The Light Rail Fleet Management Plan provides the framework for the management of the CATS' initial Light Rail Vehicle (LRV) fleet. It describes the general requirements for the LRV fleet, fleet sizing and spare ratio and the facility to be used to maintain the vehicles. It also provides a preliminary plan for maintaining the LRVs.

4.5 Engineer's Estimate Methodology

The Conceptual Design consultant will prepare a cost estimate methodology and approach based on the following principles. The Conceptual Design consultant will prepare unit capital costs and will develop preliminary capital cost estimates as a basis for final engineering. Estimates will be prepared using quantities extended by the unit process to the greatest extent possible. The Engineer's Estimate shall include all hard and soft costs, such as escalation, contingency, management and insurance costs. The current engineer's cost estimate is shown in Section 1.5.1. As the project progresses the Conceptual Design consultant will provide cost estimate updates at major milestones, including the following:

- 10% concept design
- As required for New Start submittals
- In support of major design changes
- 30% design submittal

4.6 Deliverables

As part of its assigned responsibilities, the Conceptual Design consultant will prepare a deliverable listing. This list will be based on the major deliverables shown below. The deliverable list will include, in addition to the major milestones deliverables, interim reports, technical memos, status plans and documents to provide the CMT with assurance that the Project is proceeding on schedule and in compliance with Project needs.

The major deliverables include:

- Project Operations Plan
- Document Control System
- Master Schedule
- Technical Report: *Design Criteria Procedures and Standards*
- Preliminary Design Report
- Cost Estimate
- Directive Drawings, by discipline
- Streetcar Vehicle Performance Technical Specifications
- Capital Cost Reports
- Operations and Maintenance Plan
- Purpose and Need statement
- EIS/EA outline
- Draft EIS/EA
- Summary of Draft EIS/EA Comments and Responses to Comments
- Final EIS/EA
- Streetcar Vehicle Management Plan

5 QUALITY ASSURANCE MANAGEMENT AND CONTROL

5.1 Management Policy Statement

It is the policy of the City of Charlotte that streetcar transit projects will be planned and constructed with the highest regard for quality and under the guidelines of an effective Quality Assurance Program (QAP).

Compliance with this policy is central to providing the highest quality of transit service to the residents and visitors in the greater Charlotte region.

CATS' *Quality Manual* is the governing document for all Quality Systems used at Charlotte Area Transit System. This manual meets the requirements of the Federal Transit Administration's publication, FTA-IT-90-5001-02.1 *Quality Assurance and Quality Control Guidelines*: February 2002, and is formatted similarly to ISO 9001-2000 – *Quality Management System – Requirements*.

5.2 Quality Assurance Program (QAP)

CATS' Quality Assurance Program is comprised of CATS quality policy, CATS' Quality Manual, Project Quality Plans, procedures, a management organization that supports and takes responsibility for quality, and personnel who undertake Quality Assurance and Quality Control activities.

CATS *Quality Manual* outlines the overall framework for implementation of CATS quality programs. The PMP and the Project Quality Plan ("PQP") identify specific procedures and activities to be employed to ensure that planning and design activities, including contracted services, are delivered as specified, and that the expected level of quality is achieved. The PMP will be periodically updated and expanded to include detailed procedures for all phases of the Project, from conceptual engineering, PE, final design, construction management, testing, and start-up.

5.3 QAP Implementation

CATS' requirements for safety, reliability, efficiency, and cost effectiveness in development of the Project demand that systematic, consistent, and authoritative controls, including quality-related controls, be planned and implemented as appropriate during the various phases of the Project. These project controls will facilitate early identification of conditions that might adversely affect satisfactory completion of the Project, and allow for timely corrective action to minimize repetition of problems. The QAP establishes the policies behind those quality-related controls and provides procedures to implement the controls.

CATS' primary role in implementing the QAP is to provide Quality Assurance leadership and oversight, including, but not limited to:

- Review of planning and design documents to verify that quality aspects have been considered.

- Audits of QAP activities to ensure compliance with procedures and documentation of the activities.

CATS' consultants, suppliers, and contractors are required to have effective Quality Assurance / Quality Control programs in place that are adequate for the applicable scope of their work. Quality programs will be submitted to CATS' Quality Manager for review and approval upon request.

Organizations providing professional services, architectural / engineering design, construction, or construction management to the City / CATS are required to provide a QA / QC Plan that defines the administrative and control measures appropriate for their respective scopes of services. These plans are to provide a planned and systematic approach to attaining the expected and acceptable level of quality for the work and are to be approved by CATS' Quality Assurance Manager.

5.4 Document Control

Each CATS project team, as well as CATS' contractors and suppliers, are responsible for having a documented Quality Assurance Program that includes document control with version control of documents such as the Project Operations Plan and Master Project Schedule, control of quality records, and a disaster recovery plan.

CATS' procedure, *Control and Distribution of Plans, Manuals, Policies and Procedures* (CATS QA02), describes the method for the controlled approval, release, distribution, and maintenance of version controlled documents. These documents are subject to controlled distribution to ensure that changes and updates are made in a controlled and systematic manner, and that all parties are working to the latest version of the document. Examples of these documents include CATS' Policy and Procedure Manual, Project Management Plan, Construction Manager's Manual, and others that are controlled by CATS.

Control of Public Records (CATS QA01) was developed to establish a system and assign responsibility for the identification, collection, filing, retrievability, and maintenance of CATS' records and the protection of and the destruction of records maintained by CATS.

Each CATS project team will maintain project documents, such as contract deliverables, forms, drawings, change orders, test specifications, special processes correspondence, and meeting minutes. Project records are identified in CATS records retention schedule for the Project. CATS will control the storage, retrieval, distribution, and archiving of Project documents in central Project files.

A Disaster Recovery Program has been implemented by CATS as follows:

- City IT maintains a two-week archive of e-mail messages. Retrieving documents from the back-up tapes is very costly and generally not feasible except in instances of disaster recovery.
- Electronically stored documents other than e-mails are backed-up daily. These tapes are maintained for a period of one year. Back-up tapes are stored off-site for protection in case of fire.
- CATS records are stored in approved storage areas as called-out in *Storage Facility Requirements for Records* (CATS QA09) with electronic backups where possible.
- Consultants are required to have a disaster recovery plan that is approved by CATS.

- CATS is developing a Business Continuity Plan that includes the disaster recovery program.

5.5 Design Control

As part of the POP, the Conceptual Design consultant will submit a QA / QC Plan that is acceptable to the CMT and CATS Quality Assurance Manager. The Plan should cover the following, as appropriate:

- ***Basis of Design***: The design basis should include the scope, criteria, applicable codes and standards, and regulatory requirements.
- ***Design Interfaces***: The interfaces between different design groups and design disciplines should be identified, as well as the responsibilities for both design performance and quality assurance.
- ***Design Review***: Qualified personnel other than those who originated the design will review documents at appropriate stages. Design review will include, where appropriate, such aspects as verification of the basis of design, independent check of calculations, and review of constructability. Design changes or revisions will be subject to same level of checking, review, and approval as original design.
- ***Document Control***: Design documents should be uniquely identified and controlled as required to assure the use of the appropriate document.
- ***Audits***: Designers should provide for internal audit of their POP and QC Plans.
- ***Documentation***: Quality-related activities performed by the designers will be documented and records maintained and made available for review by CATS' Quality Control Manager.

CATS Design Managers will be responsible for design review coordination with other parties as appropriate. Design submittals will be submitted to CATS QA section at prescribed intervals and reviews will be conducted using CATS formal review process. Review comments will be captured on DESIGN REVIEW PROCESS COMMENT AND COMMENT TRACKING FORMs. When a comment cannot be resolved, CATS Project Manager will make final resolution. All design packages upon completion of comment review will be forwarded to CATS QA section for final review and then forwarded to the Conceptual Design consultant's Quality department. The design review process for Final Design is covered in PMP Section 11.

5.6 Construction Control

The consultants, construction contractors, and suppliers will have an effective QA / QC Plan that ensures the following:

- All project work is performed in accordance with the engineering requirements and conforms to industry standards.
- All equipment is tested throughout development, manufacture, and installation to verify that if functions as specified.
- Work processes are controlled to ensure work is done in the appropriate sequence, and production and installation processes that directly affect quality are performed under controlled conditions and special processes, which cannot be verified by subsequent inspection and testing of product, are monitored continuously.

- Control and documentation of nonconforming work to ensure that such work is not inadvertently used or accepted.
- Positive corrective action is taken in a timely manner when early detection of an undesirable condition occurs.
- Control of the design configuration is maintained at all times to define the acceptability of equipment as established by design reviews, drawing approvals, and design verification testing, and to preserve the design configuration during retrofits and modification work.

Sub-consultants and contractors are required to submit their Quality Control Plans to the Resident Engineer in charge for initial review and approval by the Conceptual Design consultant and CATS Quality Assurance. The requirements of QA / QC in construction are addressed in the Construction Management Section 12 of this PMP.

The coordination of CATS and CATS Conceptual Design consultant's responsibilities for QA during construction are defined in the Construction Management Manual.

5.7 Quality Audits

CATS Quality Manager is responsible for managing CATS' audit program. CATS QA conducts QA audits of consultants, key testing facilities, CATS, and other entities as appropriate. Audits are conducted in accordance with *Quality Audits Procedure* (CATS QA100) to ensure that all aspects of the QAP, PQP, and QA / QC Plans have been developed, implemented, and documented, in accordance with specified requirements.

Written reports are prepared after each audit, and the findings are discussed with the auditee so that corrective action may be taken. Follow-up QA audits are used, as necessary, to confirm that corrective action has been implemented and is effective. Audit findings are reviewed with the personnel having responsibility in the area being audited. Records will be maintained of all auditing activities.

CATS QA staff will schedule audits of project activities. These audits will be shown on the Master Schedule as CATS milestones. In addition the Conceptual Design consultant will provide the CATS Quality Assurance Manager, for review and evaluation, copies of all internal QA audits and QC checking efforts performed in accordance with the consultant's approved QA Procedures.

Referenced Documents:

CATS Quality Manual
Control of Public Records (CATS QA01)
Control and Distribution of Plans, Manuals, Policies and Procedures (CATS QA02)
Storage Facility Requirements for Records (CATS QA09)
Quality Audits (CATS QA100)
CATS records retention schedule for the Project
Business Continuity Plan
Construction Management Manual
FTA-IT-90-5001-02.1 *Quality Assurance and Quality Control Guidelines*: Feb 2002
ISO 9001-2000 – *Quality Management System – Requirements*

6 PROCUREMENT

Agency (Grantee) Policies and Procedures

All procurements for the Project including land acquisition, construction, professional services and equipment contracts, shall be made in accordance with all Federal, State and local laws or regulations.

Contracts for procurements involving federal financial assistance are made in accordance with and include the appropriate contract clauses from FTA Circular 4220.1E, the FTA Master Agreement and all other provisions required as a condition of financial federal assistance. The City (CATS) encourages the utilization of Disadvantaged Business Enterprises and has adopted a DBE Program in accordance with 49 CFR Part 26. For Fiscal Year '04 an annual goal of 15.6% has been established.

Contracts involving State or local funds are awarded in compliance with State and local laws or regulations The City's Small Business Opportunity Program is applicable to contract utilizing local funds.

CATS is responsible for Procurement and Contracts. Three Contract Administration Specialists have been hired by CATS to handle Project procurements.

CATS has developed a Procedures Manual for Procurement that is consistent with Federal requirements, State law, and City procedures, and is available upon written request to the CATS Senior Project Manager.

7 PROJECT COMMUNICATIONS

7.1 FTA Coordination

It is expected that FTA will be a principal participant of the Center City / Streetcar Corridor Project. There is an ongoing relationship between City of Charlotte / CATS and FTA staff in Region 4 and Headquarters. CATS will maintain open communications with FTA throughout Conceptual Design, EIS / EA, Final Design, Construction, Start-up, and Testing.

CATS will continue to communicate with FTA staff regarding key procurement matters in order to ensure that the Project remains eligible for federal funding. Regular updates on all the corridors will be provided at the FTA / CATS Quarterly Meeting.

7.2 Reports

7.2.1. Monthly Status

The City makes written and oral reports about the status of the Project to several entities and in several forms. The CATS CEO and the Project Manager summarize the current status of Project work at each regular meeting of the PST. CATS and its Conceptual Design consultant will prepare a written project status report directed to FTA pertaining in particular to:

- Project budget versus expenditures
- Projections of costs to complete and total cost
- Progress made to date versus schedule progress
- Issues and changes
- Financial status of the project
- Cash flow status and projections
- Any anticipated funding shortfalls

The monthly status reports generally are produced in two formats: (1) A summary report for the benefit of the Project's funding agencies is limited to those matters listed above, and (2) A more detailed report, with narrative descriptions of progress and status, cost and schedule, is directed to the PST and other Project participants.

7.2.2. DBE Program

Following the close of each calendar month, CATS will prepare a DBE Program Progress Report. This report is in addition to, and will be submitted as part of, the FTA-required Quarterly DBE Progress Report. The DBE Report updates the PST and others as to the status of the Project DBE program.

7.2.3. Quarterly Progress Reports

Each calendar quarter, the City will prepare and submit Quarterly Progress Report to FTA, with copies to other funding agencies and interested parties. At a minimum, each Quarterly Progress Report will provide the following:

- Narrative comments on each budget line item for the Project

- Discussion of budget or schedule changes not requiring FTA approval that were made during the past quarter
- Comparison of scheduled activities and budgeted expenditures with actual accomplishments during the report period, including:
  - Status, bid document completion dates, bid solicitation, resolution of bid protests and contracts awarded
  - An analysis of significant project cost variances
  - Discussion of completion and acceptance of construction, procured equipment, and other work, together with a breakdown of costs incurred and costs required to complete the project
  - Reasons scheduled milestones or completion dates were not met, identifying problem areas and discuss how problems will be resolved
  - Discussion of expected impacts of project delays and the steps being implemented to minimize such impacts
  - List of all outstanding claims in excess of $100,000 and all claims settled in the report period, with a brief description of the claims and their causes
  - Projected activities for the next quarter and steps planned for carrying them out
  - Expected or projected changes in scheduled activities
  - Pertinent graphics and photographs

7.3 Coordination Meetings

7.3.1 Policy (Program Steering Team)

The PST will meet monthly or as necessary. Key staff from the CMT and the Conceptual Design consultant will attend these meetings, as required. Between regular meetings, the members of the PST will maintain communications with the PMT and Project staff. The CATS CEO will chair the meetings.

7.3.2 Management (Program Management Team)

The PMT will meet monthly or as necessary. These meetings will be attended by key staff from the CMT and the Conceptual Design consultant team, as required. Between regular meetings, the members of the PST will maintain communications with Project staff and consultants and will carry out appropriate tasks on behalf of the Project. The CATS Deputy Director of Development will chair the meetings.

7.3.3 Staff (Corridor Management Team)

The CMT will meet weekly or bi-weekly as required to coordinate its respective contributions to the Project. These meetings will combine general progress reports with detailed, task-oriented discussions to resolve current Project needs.

7.3.4 Technical Coordination Team Meetings

Regular bi-monthly technical coordination meetings will be held with representatives from other City departments and local government agencies. These coordination meetings will ensure efficiency and coordination in the planning and design effort by facilitating continuous communications between the CMT and agencies and departments that are impacted by

transit projects or have other public works projects that should be coordinated with the transit project.

7.3.5 Internal Design Review Meetings

Internal design review meetings will be held at specific points in the process. These meetings will typically focus on specific design elements and are designed to enhance communication among the CATS Project Team. These meetings allow the CATS Project Staff to talk freely about issues and concerns related to the Conceptual Design consultant's design, and to reach a group consensus on a specific design approach, thereby reducing the time spent on design options and variables.

7.3.6 Outside Agencies

Special purpose meetings will be held frequently with outside agencies, stakeholders, and designers of facilities that will be close to or in the same space as Project facilities. These meetings generally will be organized around an agenda, result in conclusions or assignments, and will be documented in meeting notes.

7.4 Public Involvement Program

CATS will continue the public involvement work that began during the Major Investment Study and will offer various opportunities for interested individuals and organizations to participate meaningfully in the Project's design, especially during Conceptual Design work.

A Public Involvement Plan has been developed for the Conceptual Design phase and will be reviewed and approved by the CMT. The following activities comprise the Public Involvement Program being conducted during the Conceptual Design phase. The CMT and the Conceptual Design consultant will provide detailed technical and presentation support.

- Local government coordination
- Mandated public hearings
- Public information meetings
- Minority community outreach
- Alignment and streetcar stop planning workshops
- Key stakeholder interviews
- Business group information exchanges
- Speakers' bureau for civic, professional, stakeholder groups
- Major transportation exhibit and colloquy
- Community events booths and mobile display
- Media relations
- Project newsletter
- Public opinion poll
- Telephone hotline
- Internet web site
- Educational videotape
- Design of Project identity symbols (logo, theme, etc.)

8 REAL ESTATE PLAN

The Center City / Streetcar Corridor Project will acquire interests in real property in order to construct and operate rail transit facilities. Much of the real estate will be occupied in perpetuity; some will be occupied temporarily, during construction. A Real Estate Plan describes policies and procedures for acquiring, managing and disposing of real estate in conjunction with the Project. It describes a program that conforms to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended by the Uniform Relocation Act of 1987, which governs federally assisted construction projects.

The Real Estate Plan will be developed by the City of Charlotte / CATS and will incorporate the subject matter presented below.

8.1 Authority and Organization

The Real Estate Plan will establish that the City of Charlotte / CATS is authorized to acquire, own, manage and dispose of real property. It will describe a staff and/or consultant organization with sufficient qualifications, skills and depth to undertake a real estate program to support the Project in a timely and cost-effective fashion. In the event that the City does not maintain adequate staff to undertake a real estate program of the magnitude required, it may select and engage a certified Right-of-Way Agent to act on its behalf. Before the actual process of right-of-way acquisition may begin, the Right-of-Way Agency and City staff must develop lines of responsibility and procedures to guide the real estate acquisition and management process.

8.2 Real Estate Acquisition Approach

Real estate property rights required for construction of transit facilities must be in hand before the start of construction thereon. Property rights include ownership in fee, permanent easements for specified uses or for limited duration, and covenants restricting use of certain properties not otherwise acquired for the Project.

The real estate acquisition process will proceed in five stages:

1. Identification and certification of required real estate
2. Appraisal of required interests
3. Acquisition through settlement (negotiation) or eminent domain (condemnation by the City of Charlotte for CATS)
4. Relocation of occupants
5. Property management, including demolition of improvements.
6. Disposal of excess property

8.3 Public Right of Way

The majority of the proposed Project trackway will be located in City of Charlotte municipal thoroughfares. For each segment where the trackway or structures are to be placed in an existing street or highway crossings, the City of Charlotte will negotiate with the controlling entity, such as NCDOT where applicable, and reach technical agreements that specify where precisely the track or structures will be located and how motor vehicle traffic and pedestrian traffic will be accommodated. If a political jurisdiction requires a franchise

agreement for use of its public space for Project purposes, such an agreement will be drawn and negotiated. Where Project tracks will cross streets at grade, there may be a need for agreements that relate to at-grade crossing protection devices and their maintenance. The City's Real Estate Agent and its General Counsel will research all of these institutional requirements and produce the necessary documents to permit use of public space for the Project.

All requirements for agreements or permits to occupy public space will be entered into the Project Master Schedule as tasks, using a particular WBS code, and thereafter tracked as to progress and criticality.

8.4 Property Disposal

The City will develop and adopt a Property Disposal Plan and related procedures, addressing all local, state, and federal requirements, covering how excess real estate will be disposed of after the Project requirements have been satisfied. The Plan will describe how to define excess property and alternative means for either disposing of it or developing it in conjunction with other interests, particularly abutters. Policies will be defined for distributing proceeds from the sale, exchange, or lease of such disposals to project accounts. The Plan will also address development of residual land as parks, green space, tot-lots, etc., where the benefits will accrue to the local community. The Plan will address policies and procedures for assembly of contiguous remainders into more viable new parcels.

Principles and policies addressing transit station area joint real estate development (see Section 11 for more information) were collaboratively developed as part of the South Corridor LRT project. These policies and procedures will address negotiations with developers, formation of assessment districts, acquisition of land, and the joint use of land and property rights. As approved by the City / CATS, these policies and procedures will be incorporated into the Project.

9 HUMAN RESOURCES AND LABOR RELATIONS

9.1 Statutory Requirements

The CMT is fully cognizant of the responsibility to adhere to all laws and regulations related to human resources and labor relations applicable to the Project. The requirements listed in the sections below represent those generally applicable to the Project. The City, however, will adhere to all applicable requirements even if not specifically mentioned herein. As the Project continues to advance, the City will adjust its policies and procedures as necessary to achieve full compliance with all applicable requirements.

9.1.1 State and Local Requirements

The City of Charlotte / CATS, including its consultants and contractors, will adhere to all State and local laws, ordinances, and regulations related to human resources and labor relations applicable to the Project.

9.1.2 Federal Requirements

The City of Charlotte / CATS, including its consultants and contractors, will adhere to all Federal laws, ordinances, and regulations related to human resources and labor relations applicable to the Project.

By use of federal funds on the Project, the City of Charlotte must conform to certain federal requirements in the personnel/labor area, and meet other federal requirements that apply regardless of funding sources. Those cited here might not be complete, but they cover most of the federal requirements that apply.

9.1.2.1 Civil Rights Requirements

The City / CATS must comply with all civil rights program requirements that apply to transit-related projects. The applicable civil rights program areas are:

- Title VI of the Civil Rights Act of 1964 (Service Delivery/Benefits)
- Equal Employment Opportunity (EEO)
- Disadvantaged Business Enterprise (DBE) Program (49 CFR Part 26)
- Americans with Disabilities Act

All required civil rights program submissions must be approved by FTA and periodically updated in accordance with program guidelines.

9.1.2.2 Nondiscrimination in Federal Transit Programs

Section 19 of the Surface Transportation Assistance Act of 1978 states that no person shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination on the basis of race, color, creed, national origin, sex, or age on any project, program, or activity funded in whole or in part through FTA financial assistance. This nondiscrimination provision applies to employment and business opportunities and is to be in addition to the provisions of Title VI of the Civil Rights Act of 1964.

9.1.2.3 Title VI

In requesting federal financial assistance pursuant to FTA programs covered by UMTA circular, "Federal Aid Urban System (FAUS) Transit Projects," and by FTA Circular 4702.1, "Title VI Program Guidelines for Urban Mass Transportation Recipients," the City of Charlotte must adhere to Title VI requirements. Once the Title VI submissions have been approved, updates are required every three years unless otherwise requested by FTA.

9.1.2.4 Equal Employment Opportunity (EEO)

Because of the magnitude of the Center City / Streetcar Corridor Project, the City of Charlotte is required to have its EEO programs approved by FTA. Further, this requirement must be extended to City contractors who have more than 200 employees. The City has an Equal Employment Opportunity Program that is maintained and updated periodically.

9.1.2.5 Affirmative Action Plan

The City of Charlotte maintains an Affirmative Action Plan (AAP) as a part of its EEO Program. Responsibility for assuring equal employment opportunity and for carrying out AAP objectives rests with the City of Charlotte Human Resources Department**.** For day-to-day monitoring of the staff in these matters, the City has appointed an EEO Coordinator.

The AAP will generally cover the following subjects:

- Affirmative Action Plan
- Designation of Responsibility
- Scope of Affirmative Action Program
- Dissemination of Policy
  - Internal Dissemination
  - External Dissemination
- Implementation Responsibility
- Utilization Analysis
- Areas of Concern
- Action-Oriented Programs
  - Position Description Development/Reviews
  - Training Programs
  - Student Internship Program
  - Employee Mentorship Program
- Sex Discrimination Guidelines
- Religious Discrimination
- National Origin Discrimination
- Handicapped/Physically Challenged Discrimination
- Disabled or Vietnam Era Veteran Preference
- Participation in Community Action Programs
- Internal Audit and Reporting System
- Instructions for Completion of Exhibits
- Exhibits
  - Workforce Analysis
  - Identification of Job Groups
  - Availability Computation
  - Primary Feeder Groups and Sourcing Mix

  - Secondary Feeder Groups
  - Promotability Analysis
  - Underutilization Analysis
  - Summary of Prior Year AAP Results
  - Non-attained Goals Review
  - Applicant Flow by Job Groups
  - Hire Analysis by Job Groups
  - Analysis of Promotions and Transfers by Job Group
  - Analysis of Terminations by Job Group
  - Action-oriented Programs Participation
  - Recruitment Analysis
- *Historical Utilization*

9.1.2.6 Disadvantaged Business Enterprise (DBE) Program

The City of Charlotte must meet the requirements of the U.S. Department of Transportation's Disadvantaged Business Enterprise Regulation (49 CFR Part 26).

The City of Charlotte/CATS encourages the utilization of Disadvantaged Business Enterprises and has adopted a DBE Program in accordance with 49 CFR Part 26. For Fiscal Year 2004 an annual goal of 15.2% has been established.

As the Project enters the construction and procurement stage, opportunities for DBE participation will expand in magnitude and types of work.

9.1.2.7 Nondiscrimination on the Basis of Age

The City will comply with all applicable requirements of the Age Discrimination Act of 1975 and all implementing regulations that prohibit employment or other discrimination on the basis of age.

9.1.2.8 Access and Nondiscrimination Requirements for Persons with Disabilities

The City of Charlotte and its contractors must comply with all applicable requirements of the Americans with Disabilities Act of 1990; Section 2004 of the Rehabilitation Act of 1973, as amended; Section 16 of the Federal Transit Act, as amended; and the following regulations and amendments thereto:

- USDOT regulations, "Transportation Services for Individuals with Disabilities (ADA)," (49 CFR Part 37)
- USDOT regulations, "Nondiscrimination of the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance" (49 CFR Part 27)
- USDOT regulations, "Americans with Disabilities Accessibility Specifications for Transportation Vehicles," (49 CFR Part 38)
- Department of Justice regulations, "Nondiscrimination on the Basis of Disability in State and Local Government Services," (28 CFR Part 320)
- USDOT regulations, "Nondiscrimination on the Basis of Disability in Public Accommodations and in Commercial Facilities," (28 CFR Part 36)

- General Service Administration regulations, "Accommodations for the Physically Handicapped," (41 CFR Subpart 101-19)
- EEO Commission "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," (29 CFR Part 1630)
- Federal Communications Commission regulations, “Telecommunications Relay Services and Related Customer Premises Equipment for the Hearing and Speech Disabled, (47 CFR Part 64, Subpart F)
- FTA regulations, "Transportation for Elderly and Handicapped Persons," (49 CFR Part 609)

9.1.2.9 Federal Labor Requirements

The City of Charlotte, including its third-party contractors, will comply with all federal wage and hour requirements applicable to the Project, including but not limited to:

- Davis-Bacon Act, 40 USC 267a
- The Contract Work Hours and Safety Standards Act, 40 USC 327- 333, including US DOL regulations “Safety and Health Regulations for Construction,” (29 CFR Part 1926)
- Copeland Act, 18 USC Section 874, et seq. as supplemented by Department of Labor regulations set forth in 29 CFR Parts 1, 3, 5, 6, and 7
- Employee protection requirements for non-construction employees pursuant to The Contract Work Hours and Safety Standards Act, 40 USC 327 – 332 and US DOL regulations, “Labor Standards Provisions Applicable to Non-Construction Contracts Subject to the Contract Work Hours and Safety Standard Act,” (29 CFR Part 5)

As project needs warrant, the City will develop procedures for determining and monitoring local labor rates as required.

As a condition of federal financial assistance, the City will enter into such transit employee protective arrangements as required by US DOL pursuant to 49 USC Section 5333(b) and the implementing guidelines, “Section 5333(b), Federal Transit Law,” 29 CFR Part 215.

9.2 State and Local Labor Requirements

The City, including its third-party contractors, will comply with all State and local wage and hour requirements applicable to the Project.

Pursuant to NCGS §95-98, contracts or agreements between the City and any labor union, trade union or labor organization, as the bargaining agent for City employees, are against the public policy of the State and deemed illegal, unlawful, void and of no effect. As a condition of federal financial assistance and pursuant to 49 USC § 5333(b), the City will enter into such transit protective arrangements as determined necessary by the U. S. Department of Labor.

10 LEGAL REQUIREMENTS AND AGREEMENTS

The Center City / Streetcar Corridor Project will be developed, constructed and operated in compliance with all applicable federal, state and local laws or regulations. The Project will be coordinated and organized in a manner to ensure that all agreements, approvals or other arrangements necessary to meet Project needs will be developed and/or executed in a timely fashion.

10.1 Legal Counsel

The City Attorney, who manages the legal affairs for the City of Charlotte, will coordinate and oversee legal support for the Project. City legal staff will continually assess the support needs throughout the Project's development, construction and operation phases to ensure that such needs are addressed in a timely manner.

A combination of City legal staff and outside counsel will support the Project. At present time, two attorneys and a paralegal from the City's legal staff are assigned to work with CATS on a full-time basis. Given the broad range of legal support the Project will require, the combined use of City legal staff and outside counsel will better assure that legal assistance is tailored, based upon considerations of expertise and efficiency, to meet the needs of the Project.

10.2 Funding Mechanisms

A number of formal agreements and funding mechanisms will be required to assure the City of Charlotte has an appropriate level of funding to finalize the development, initiate and complete construction and operate the Center City / Streetcar Corridor Project. It is anticipated that Project costs will be shared through Federal, State and local funding.

10.2.1 Local Funding

The voters of Mecklenburg County approved a referendum on the levy of a one-half percent local sales and use tax for the purpose of financing public transportation systems on November 3, 1998. Proceeds from this tax will be appropriated for the local share of the Project.

10.2.2 State Funding

The North Carolina General Assembly enacted legislation in 2000 that authorizes the Secretary of the Department of Transportation to execute State Full Funding Grant Agreements ("SFFGA") for recipients of federal financial assistance pursuant to 49 USC §5309. [NCGS §136-44.20(b1)] The City, along with other transit agencies in the State, is in the process of working with the NCDOT to work out the mechanisms and timing that such grants will be awarded. The City also actively monitors the State budget process to ensure that its projects share in appropriations for public transit projects. To date, the City has received $5,658,500 in State appropriations for the Project.

In 2001, the North Carolina General Assembly enacted legislation creating a Transit Trust Fund. The legislation provides that the Transit Trust Fund can be used to provide State-matching funds for federally funded major transit investment projects.

10.2.3 Federal Funding

In accordance with the *CATS 2025 Adopted System Plan*, the Project is assumed to pursue federal financial assistance through grants awarded by the FTA pursuant to 49 USC §5309. Additional federal financial assistance for the completion of Final Design and construction would therefore be anticipated through a FTA Full Funding Grant Agreement ("FFGA"). Such assistance is subject to completion and review of the PE/EIS/EA, issuance of the Record of Decision, securing the Project local funding share and federal budgetary appropriations. In accordance with FTA regulations or other directives, the City will strive towards securing FFGA status.

10.2.4 Full Funding Grant Agreement

A Full Funding Grant Agreement (FFGA) is assumed in the *CATS 2025 Adopted System Plan* and would therefore be developed between the City of Charlotte and FTA, establishing the terms and conditions by which FTA will provide funding for final design and construction of the Project. The City and FTA would draft terms for the FFGA during the course of the PE/EIS/EA phase. The FFGA would follow completion of the PE/EIS/EA, issuance of a Record of Decision concerning the Project from the FTA, establishment of a local funding source, and budget approval by the federal government for Project funding.

10.2.5 Letter of No Prejudice for Final Design

In order to maintain and achieve the schedule for construction and operation, the City may consider incurring the expenditure of local funds for right-of-way acquisition and final design in advance of receiving the FFGA. The parameters of any such advance expenditures, however, shall be defined in a manner that allows FTA to approve and authorize the expenditures through Letters of No Prejudice.

10.3 Cooperative Agreements

Cooperative Agreements will be developed with other governmental agencies as Project needs require. Such agreements shall establish the rights and obligations of the parties, and will be negotiated and approved by the appropriate authorities or representatives of those authorities. These agreements will be developed during Final Design and pre-Start-Up state for purposes such as the following:

- Sharing space and/or facilities
- Timely review by agency staff of plans and specifications for Project facilities that will be located in the public rights of way or affect public infrastructure or require permitting, or contractor submissions such as shop drawings affecting public infrastructure or maintenance of traffic plans
- Occupancy of other agency property such as public streets adjacent to Project facilities
- Regulations affecting construction, such as work hours, permitting procedures and environmental performance standards
- Services contracted to agencies during construction, such as traffic control or the temporary or permanent removal of public facilities
- Post-construction operating agreements for facilities constructed for the Project that will be control by other agencies such as traffic control facilities or drainage structures

- Agreements for the provision of public service for Project facilities, such as fire, policy or emergency response, and maintenance as required

Memoranda of Understanding or other implementing agreements shall be developed prior to the start of or during final design as required.

10.4 Joint Use Development Agreements

Joint use development refers to shared use of real estate for transit facilities and privately owned facilities, or coordinated use of parcels in close proximity to one another in a way that each party depends on the action of the other for mutual benefit. For example, joint use development could occur at a station site where the Project would benefit from certain types of adjacent land use. The Project might acquire real estate and arrange with a private or public entity to develop non-transit facilities with controls to protect or benefit the transit function. Terms of joint use developments will be stipulated in contractual agreements between the City of Charlotte and a developer.

The City of Charlotte will establish policies and procedures to govern joint use development in accordance with FTA Policy on Transit Joint Development as set forth in the Federal Register: March 14, 1997 (Volume 62, Number 50) and Appendix B of FTA Circular 9300.1A. Before the City enters any such agreements, however, they must be reviewed and approved by FTA on a case-by-case basis. FTA allows great flexibility in the nature of joint development that qualifies for inclusion in a project that it finances. To receive FTA approval, joint use development must be directly related to the transit project and must be adjacent to or within certified right-of-way.

10.5 Permits and Clearances

Before certain construction work can begin, and even before vital funding can be secured, the City of Charlotte / CATS will obtain certain permits and clearances or will delegate their procurement to contractors. The PE/EIS/EA is requisite to obtaining a Record of Decision, the "permit" that allows federal funds to be committed under an FFGA. There are many other permits and clearances required from entities mandated to protect the public in some way. Contract specifications will indicate for construction or procurement contracts what relevant permits and clearances will be required and which party will be responsible for satisfying the controlling agency. For example, construction contractors will be required to obtain their own building permits from the relevant jurisdictions and for obtaining the required inspections and certifications of work in place, as stipulated by local codes. More-specific definitions of these requirements and the allocation of responsibilities between the City and other will be added to the PMP as they are developed.

10.6 Labor Agreements

Pursuant to NCGS §95-98, contracts or agreements between the City and any labor union, trade union or labor organization, as the bargaining agent for City employees, are against the public policy of the State and deemed illegal, unlawful, void and of no effect. As a condition of federal financial assistance and pursuant to 49 USC § 5333(b), the City will enter into such transit protective arrangements as determined necessary by the U. S. Department of Labor.

10.7 Financing Instruments

The City will develop a Financing Plan as required by FTA regulations. Project-required financing instruments and the PMP will be amended as may be required.

10.8 Professional Services and Construction Contracts

The City of Charlotte will enter into contracts for engineering, design, and other professional services, construction and procurement to implement the Project. Policies and procedures for establishing contract terms and managing contract performance shall be consistent with all applicable federal regulations, when federal financial assistance is utilized for such contracts, and City procurement policies and procedures.

11 FINAL DESIGN APPROACH

CATS approach for final design will be as defined in section 2.6.2.

Detailed policies and procedures for the final design services and activities will be developed during the PE/EIS/EA phase. The initial phase will be the development of the Continuing PE phase of the project, which will allow for a detailed understanding of the cost implication of major project elements such as real estate, the maintenance facility, and related structures. Major topics to be covered will include:

Work Scope (both for Continued PE and final design)
Value Engineering Application
Design Standards and Quality Assurance
Design and Constructibility Reviews
Design Bid Documents and Engineers Estimate
Support during Construction

12 CONSTRUCTION MANAGEMENT

Policies and procedures for the Construction Management services and activities will be developed during final design. Topics to be covered will include:

Management Plan
Construction administration
Inspection
Change Control
Quality Control
Safety

13 TESTING

Policies and procedures for the Materials Testing services and activities will be developed during Final Design. Topics to be covered will include:

Materials Testing
Acceptance Testing
Integrated Testing
Pre-Revenue Testing
Test Procedures
Test Scheduling
Test Performance
Control of Discrepant Items

14 SAFETY MANAGEMENT

The Charlotte Area Transit System (CATS) considers safety and security a major component of the overall Corridor Project effort. The safety and security component is documented as a separate document entitled:

Corridor Projects Safety and Security Management Plan.

The Corridor Projects Safety and Security Management Plan (SSMP) formalizes the safety and security program management activities, in accordance with *FTA Circular 5200.1 "Full Funding Grant Agreement Guidance".*

The Corridor Projects SSMP sections focus its project management activity to:

- ✓ Specify responsibilities for safety and security
- ✓ Articulate an agency *Safety and Security Policy*
- ✓ Develop and endorse a process for certifying the safety and security of the project
- ✓ Establish *milestone controls* to assess the project's adherence to major safety and security activities in the project

The Corridor Projects SSMP also documents assurances that CATS is taking a *systems* approach to safety and security, defined as:

> "The application of engineering and management principles, criteria, and techniques to optimize all aspects of safety and security within the constraints of operational effectiveness, time, and cost throughout all phases of the system life cycle."

This approach is applied not only to the design, construction and acceptance of system components, but also to those activities that will support revenue operation. This approach also ensures that deviations from the approved design, construction change orders, and work-arounds are evaluated to ensure no degradation in safety and security.

By documenting project activities to implement this approach, the Corridor Projects SSMP provides a vehicle for establishing a mutual understanding among executive management, program management, and safety/security management regarding the process in place to support the identification and resolution of their respective concerns. The Corridor Projects SSMP complies with 49 CFR Part 659 (State Safety Oversight) requirements; the Corridor Projects SSMP identifies interactions between CATS and the North Carolina Department of Transportation (NCDOT) that serves as the State Safety Oversight Agency during project development and operations. Finally, the Corridor Projects SSMP provides assurances for all involved in the project that decision-makers will:

- Ensure that safety and security requirements for the Corridor Projects are properly addressed throughout the project.
- Ensure that system safety and security functions are properly coordinated.
- Ensure that all identified hazards, vulnerabilities, and their associated risks are defined, documented, and tracked as a program policy, so that all decision-makers, at each stage of the project, are made aware of the risks being assumed.

In summary, the Safety and Security Program for the Pre-Revenue and Revenue Operations will be fully compliant with Federal Regulation 49 CFR, Part 659, and the North Carolina State Safety Oversight Standards and Procedures. Safety and Security Program details are provided in the Corridor Projects SSMP.

15 RISK MANAGEMENT

Policies and procedures for the Risk Management services and activities will be developed during Final Design. Topics to be covered will include:

Definition and Responsibilities
Management oversight
Risk Control
Bonding
Insurance program

16 START UP AND TESTING

Policies and procedures for the Start up and Testing services and activities will be developed during Final Design. Topics to be covered will include:

Design Conformance
Vehicle Acceptance
Systems and integrated testing
Safety Certification

17 APPENDIX A

Appendix A

(Inter-Local Agreement Forthcoming)

18 APPENDIX B

Appendix B

(Memorandum of Understanding Forthcoming)

19 APPENDIX C

Appendix C

CENTER CITY/ TRADE STREETCAR PROJECT

CENTRAL AVENUE & BEATTIES FORD ROAD STREETCAR EXTENSIONS

SCOPE OF WORK

OVERVIEW

The Streetcar Concept: The Trade Street Streetcar project is a key recommendation of the 2025 Corridor System Plan. The Trade Street Streetcar is conceived as a "Portland" type streetcar system utilizing modern vehicle technology based on the European "Tram" than is a smaller, lighter weight vehicle than those use for "Light Rail Transit" and is capable of operating in the street with mixed traffic. The streetcar will fulfill many roles including:

- Establishing an east-west transit spine that links all five rapid transit corridors in downtown and provides easy movement between the existing Transportation Center and the proposed Multimodal Station.
- Enhancing Center City mobility.
- Improving connections for neighborhoods that are immediately outside the freeway loop.
- Connecting key institutional uses, such as Central Piedmont Community College, Johnson & Wales University, Johnson C. Smith University, and Presbyterian Hospital.
- Supplementing CATS two heaviest bus routes improving operating efficiency.

Relationship to 2025 Transit System Plan: The streetcar project will be designed so it is compatible with the existing and planned CATS bus operations within the streetcar corridor as well as connecting bus services. Additionally, the design needs to be carefully integrated with the implementation of the following other elements of the 2025 Transit System Plan and the selected consultant team will be expected to coordinate closely with the consultant teams working on these other elements:

- North Corridor Commuter Rail and proposed Charlotte Multimodal Station on West Trade Street.
- South Corridor Light Rail Project.
- Existing Transportation Center on East Trade Street.
- Northeast Light Rail Project.
- Southeast/West Rapid Transit Corridor.

Relationship to the Center City 2010Vision Plan: The Trade Street Streetcar project is also key to the implementation of the *Center City 2010 Vision Plan*. The Streetcar will be an important element in fulfilling the Vision for a "Viable, Livable and Memorable Center City." The streetcar system shall be designed to contribute

toward the key objective of the 2010 Plan: "To create a livable and memorable Center City of distinct neighborhoods connected by unique infrastructure".

Relationship to the Center City Transportation Study: In the fall of 2003, CDOT and CATS commenced a Center City Transportation Study (CCTS). CCTS is developing an integrated multi-modal transportation plan that also builds upon objectives in the 2010 Center City Vision Plan that emphasize the development of a "walkable" or "pedestrian-oriented" Center City. The study has defined a "pedestrian-oriented" core area that focuses upon the transit system, including Streetcar, and will integrate systems improvements for pedestrians, bicycles, motor vehicles, parking, transit, and land development. The Trade Street Streetcar project will be an integral component of this integrated transportation system.

PROJECT DESCRIPTION

As defined in the Transit System, the Streetcar Project consists of four elements:

- The Trade Street Streetcar extending the length of Trade and Elizabeth Streets from approximately Presbyterian Hospital on the east to the vicinity Johnson C. Smith University on the west.
- The Central Avenue Streetcar extending from the Presbyterian Hospital end of the Trade Street element to the vicinity of Eastland Mall using Central Avenue for the majority of the route.
- The Beatties Ford Road Streetcar extending from the vicinity of Johnson C. Smith University along Trade Street and Beatties Ford Road to approximately I-85.
- The Downtown Streetcar Loop following a route that will be defined as some combination of 11th Street, 10th Street, 9th Street, 8th Street or 7th Street on the north side, McDowell Street or Davidson Street on the east side, Stonewall Street or Second Street on the south side, and Graham Street, Mint Street or Pine/Poplar Streets on the west side.

The Project also includes urban design and streetscape design for the Trade Street Corridor from Kings Drive to I-77.

SCOPE OF WORK

Introduction

The Consultant shall be responsible to provide planning, engineering design, and environmental services to develop the project conceptual design. The conceptual design shall represent design to the 10% level of completion and may be considered the Project baseline, and shall be sufficient to fully establish the physical requirements of the streetcar corridor and its extensions and the associated costs, benefits, and impact. The work of the Consultant shall culminate with the submittal of a final report, which shall include the following general tasks:

- Conceptual drawings depicting the Trade Street Streetcar Corridor and its extensions.
- Center City conceptual streetscape plan for the Trade Street Corridor from Kings Road to I-77.
- Feasibility analysis and recommendation for the preferred downtown streetcar loop.
- Environmental impact assessment.
- Streetcar implementation plan.
- All preliminary design documents and plans contained as subtasks in the following sections of this Scope of Work.

TASK 1.0: PROJECT MANAGEMENT

Purpose:
The Consultant shall be responsible for the overall administration and management of the project. The Charlotte Area Transit Authority (CATS) will function as the project owner and operator, and the Consultant's primary responsibility shall be to serve as an extension of CATS staff and to always act in CATS' best interest. The Consultant's responsibilities shall include all of the administration, management, reporting, and quality control functions needed to develop and complete the conceptual design of the project. It is anticipated and expected that the Consultant will assemble a team of professionals (e.g. planners, architects, engineers, design consultants, etc.) to help in fulfilling the project responsibilities. The Consultant's responsibilities shall include oversight of the Consultant team to insure fulfillment of the project objectives, compliance with the applicable regulations, and Consultant team accountability.

1.1: PROJECT MANAGEMENT PLAN

Approach:
The Consultant shall develop, update, and maintain the Consultant's Project Management Plan. Submit the Consultant's Project Management Plan to CATS for review and approval. As part of this work, the Consultant shall provide information such as organization charts, labor and cost budgets, a project baseline schedule, and quality control and assurance plans.

Deliverables:
- Project Management Plan
- Organization chart identifying employees responsible for each task, where the employee is located, and percent commitment to project.
- Labor and cost budget for each task.
- A project baseline master schedule including specific milestone dates for initiating and completing all design and other program activities involved in the project (hardcopy and digital).
- List of deliverables

- Contacts list
- Quality control and quality assurance plans.
- Document control plans.

Assumptions:

- CATS developing overall system PMP
- CATS to provide format
- URS to develop project PMP
- Use customized URS QA/QC Plan version, or
- CATS to provide a QA/QC Plan example from other corridor if available
- CATS to provide a Document Control Plan example version from other corridor.

1.2: PROJECT MANAGEMENT MEETINGS AND MANAGEMENT OVERSIGHT

Approach:

The Consultant project manager and/or appropriate Consultant technical staff will meet with the City's project manager and appropriate City staff, to coordinate activities, review progress and budget, identify issues and courses of action needed to resolve those issues. Wherever possible, costs attributable to said meetings should be minimized through use of telecommunications and limiting attendance only to those deemed essential for the meetings.

Consultant Activities and Assumptions:

- Attend bi-weekly meetings through the duration of the project, attend coordination meetings with City, project team members and others necessary to report and discuss project status and identify/resolve issues.
- Develop Action Item Status Lists that identify issues and the entity responsible for resolving the issues.
- Prepare and distribute meeting minutes.
- Provide an updated Status list of task deliverables monthly.
  - Bi-weekly meetings for 12 months.
  - URS will prepare Meeting Minutes and Action Item/Status Lists for each meeting.
  - Bob Post (URS) will make 2 trips.
  - Project Manager oversight and involvement on project activities.
  - Breakdown by task (assuming a total of 480 hours):
    - Task 3 = 80 hours
    - Task 4 = 120 hours
    - Task 5 = 80 hours
    - Task 6 = 60 hours
    - Task 7 = 20 hours
    - Task 8 = 40 hours
    - Task 9 = 60 hours
    - Task 10 = 20 hours

- An "Owners Indemnity Endorsement" insurance policy will not be required. Contractual terms will be amended to remove the requirement that THE CITY be named as an additional insured under URS' professional liability coverage.
- Assumes a reproduction budget of $1,000. Additional reproduction, if required, will be picked-up by CATS.

***Deliverables*:**

- Meeting minutes within five calendar days.
- Materials for project and issues meetings as required.
- Action Item Status list three days prior to scheduled coordination meetings.

1.3: PROJECT COORDINATION / DOCUMENTATION / CORRESPONDENCE

Approach:

The Consultant will prepare and implement, consistent with the City's document control system, a document control system for the project. The Consultant will prepare and distribute all incoming and outgoing correspondence, and maintain a project filing system and library at the Project Office site.

Consultant Activities and Assumptions:

- Provide office space for a Central Project Filing System / Library.
- Establish Central Project Filing System and Library.
- Provide and maintain computer systems for the Project Office.
- Provide appropriate digital or paper copies to the City of all material and substantive project correspondence and submittals to which the City has not been party to.
- Compile and maintain list of names, addresses, phone and fax numbers of the Consultant, agency staff and policy makers, local government representatives, and others active in the project in coordination with CATS Community Relations Specialist for City's use.

***Deliverables*:**

- Provide appropriate digital or paper copies to the City of all material and substantive project correspondence

1.4: MONTHLY REPORTING / INVOICES

Approach:

The consultant will confer with the City to develop an invoice format. The Consultant will prepare and submit monthly reports, which will include an invoice for payment and a progress report, which will identify and status critical path activities. The monthly report, which shall be provided within 15 days of the end of the prior month, will address estimated percentage of work completed and budget expended per task; schedule activity report; work activities anticipated for the following month by task; existing and anticipated issues/problems that may affect the budget, schedule or work products; updated project schedule with milestones and deliverables; as well

as an invoice format that documents all project costs for the period and to date, with remaining budget by task. Under conditions of schedule slippage directly attributable to the Consultant and as directed by the City, the Consultant will prepare a "recovery plan" to assure compliance with project needs.

In submitting an invoice that includes charges for subcontractor activities, the Consultant acknowledges that it has reviewed and agrees with said charges and that the activities were in fact required to meet this Scope of Work.

Consultant Activities and Assumptions:

- Prepare Monthly Invoices, Progress and Schedule/Milestone reports within 15 days of the end of the prior month.
- Review and approve monthly invoices of subconsultants.
- Progress reports and invoices prepared monthly.
- CATS to provide example versions from other projects if specific format is desired.

***Deliverables*:**

- One original and one copy (hardcopies) and a digital form of the monthly report and supporting documents.

TASK 2.0: PUBLIC AND AGENCY INVOLVEMENT

Purpose:

This task involves support of the City's public outreach efforts aimed at maximizing the participation of all interested parties in the project and ensuring compliance with applicable state and local law regarding environmental review.

2.1: PUBLIC INVOLVEMENT PLAN

Approach:

CATS will prepare a public involvement plan, which describes planned public and agency involvement activities for the project. The plan will build upon previous activities in the Transit System Plan, activities related to the Multi Modal Transportation Center and the Center City Transportation Study and will identify roles and responsibilities for each type of activity. It will envision establishment, where appropriate, of advisory committees to provide public input on major issues. The Consultant will support the plan through the preparation of technical materials for public meetings and attendance at meetings.

Work By Others:

- CATS will prepare a public involvement plan.

2.2: PUBLIC MEETINGS

Approach:

CATS will hold a number of public meetings to present information to the general public, as well as to receive input. The Consultant will assist CATS in preparing for these meetings, presenting technical information (when requested), and documenting the meetings. In addition, the Consultant will attend a wide range of public meetings, including public open houses, station/station area planning meetings, meetings of the Metropolitan Transit Commission (MTC), the Mecklenburg-Union Metropolitan Planning Organization (MUMPO), the Charlotte-Mecklenburg Planning Commission (CMPC), Charlotte Center City Partners (CCCP), and related committees. Additional meetings with city, county, or agency staff may be required. Define a public involvement and input process that includes transit riders, property owners, neighborhoods, merchants, Charlotte Center City Partners, and other interested Center City groups having a vested interest in the vitality of the Center City. Establish a broad public stakeholders list, list of community-wide organizations, list of governmental units and agencies, and list of public utilities.

Consultant Activities and Assumptions:

- URS Team to review draft Public Involvement Plan and provide comments
- Prepare technical information, as needed to support meetings.
- Prepare minutes/summaries of each meeting attended.
- Leadership Interviews (35 total), 2 person interviews at 2 hours
- Initial Community Wide Workshop (1), 2 hours workshop
- Sub-Area Meetings (typically 3 rounds, two per sub-area per round – one for an advisory committee and the other for the general public):
    - Beatties Ford road (1 round = 2 meetings)
    - Gateway Village / Third Ward / Johnson C Smith University (3 rounds = 6 meetings)
    - CBD / 4th Ward / Government District (3 rounds = 6 meetings)
    - Elizabeth Avenue (3 rounds = 6 meetings)
    - Central Avenue / Hawthorne Lane (1 round = 2 meetings)
- Final Community Wide Workshop (1), 2 hour workshop
- Unscheduled Meetings (15 total)
- Craig Amundson (URS) will make 2 trips.
- Diana Mendes (DMJM) will make 1 trip.
- Assumes a reproduction budget of $22,500. Additional reproduction, if required, will be picked-up by CATS.

Work By Others:

- CATS will lead the preparation effort of the PIP
- CATS will be responsible for reviewing all technical presentation materials prepared by the Consultant, setting up all logistics, equipment, staffing for sign up/registration tables, distribution of handout materials and notification requirements for each public meeting.
- CATS will develop meeting attendance rosters, and collect and distribute the rosters and the public comment sheets to the Consultant.

- CATS to provide stakeholder list from Center City Transportation Study

Deliverables:

- Agendas, graphics, other presentation materials (including PowerPoint), sign up sheets, citizen registration materials, brochures, comment sheets and other handouts, as required, for the public open house events, neighborhood meetings and public hearings.
- Minutes/summaries of each meeting.
- Maps (with indexing system).
- Renderings, computer simulations or other meaningful tools for use in public meetings.
- Summary of Personal Interviews
- Leadership Issues Summary Report
- Community Issues Summary

2.3: NEWSLETTERS

Approach:

The Consultant will assist in the preparation of quarterly newsletters through the duration of the project to communicate with the general public about the progress of the project. These newsletters will include text, graphics, tables, and survey information, as may be required. The Consultant will provide appropriate technical text, project milestone descriptions and maps/drawings for CATS staff to further develop and edit. Each newsletter will cover the activities associated with the project. Newsletters will be prepared and distributed over the span of the project schedule. The final layout, editing, color and graphic theme, as well as review of the print proofs will be the responsibility of CATS. CATS will be responsible for the printing and mailing or electronic delivery of the newsletter.

Consultant Activities and Assumptions:

- Assist in identifying key issues to be addressed in each newsletter in cooperation with CATS and Corporate Communications.
- Prepare draft text, graphics, and tables for each newsletter and submit to CATS.

Work By Others:

- CATS to prepare final text, graphics, and tables for each of the newsletters.
- CATS to prepare camera ready newsletters for printing and distribution.
- CATS to maintain project database mailing list for delivery of newsletters and other project information.

Deliverables:

- Draft text, graphics, and tables for each newsletter.

2.4: WEBSITE MANAGEMENT

Approach:
CATS current website (**www.ridetransit.org**), which is linked to the City's website, will host the Streetcar Corridor planning and design information web-based efforts. This website for the Corridor project will be developed and maintained as a supplemental means to inform the general public and to receive public input. Newsletters and other public information materials will be presented on the website. Additional interactive surveys, questionnaires, virtual open house documentation, and other public involvement efforts will be generated under this task.

Consultant Activities and Assumptions:
- Create background network of files and information.
- Provide project information to the CATS webmaster for posting on the CATS website.
- Generate additional website materials as required to support overall public involvement objectives.

Work By Others:
- CATS will maintain and operate the project website.

Deliverables:
- As needed, base information and updates suitable for insertion into the web page.

TASK 3.0: CONCEPTUAL DESIGN OF THE TRADE STREET STREETCAR CORRIDOR

Purpose:
The purpose of this task is to provide preliminary engineering and environmental services for the planning and design of a "Portland" type streetcar project for the segment along Trade Street between Presbyterian Hospital and Johnson C. Smith University.

3.1: SURVEYING AND MAPPING

Purpose:
The purpose of this sub-task is to prepare the necessary survey mapping to support project preliminary engineering services. This includes generally 1" = 200' photography of the entire rail line and 1" = 20' mapping of the alignment.

Approach:
The Consultant will prepare the following mapping and survey information:
- Color aerial photography at a scale of 1" = 200' for the length of the corridor and covering a full city block to each side of Trade Street.

- Survey ground controls based horizontally on NAD83 datum and vertically on NAVD88 datum and tied to NCGS or city of Charlotte Monumentum
- Survey mapping at a scale of 1" = 20'. Mapping limits of 50 feet either side of street centerline, a sufficient distance to define edge of sidewalk, major site features (fences, wall, etc.), and the fronts of buildings and building entrances. The survey shall provide topography at a level sufficient to define profile and cross-section conditions. The survey shall locate all surface features (utility covers, fire hydrants, light standards, utility poles, fixed street furniture, etc), define surface materials (concrete, asphalt, pavers, etc.), and locate all sub-surface utilities as required below.
- Survey mapping of all overhead structures within the study width as defined above, including bridges, building canopies, projecting signs, and similar structural features.

Work By Others:

- CATS will provide all City standards applicable to surveying services.
- CATS will provide existing GIS, aerial photography and other special surveys as are available for the study area.

Deliverables:

- Survey mapping as described above will be provided in hard copy and digital form.

3.2: GEO-TECHNICAL AND SUB-SURFACE UTILITY INVESTIGATIONS

Approach:

The consultant will provide geo-technical and sub-surface utility surveys as required to support the design of the proposed streetcar alignment.

Consultant Activities and Assumptions:

- Perform 20 borings at 20 locations and 10' depth covering Beatties Ford Road, Trade St and Elizabeth Avenue.
- Geotechnical work completed by Trigon.
- Pavement condition survey simultaneous with borings survey.
- AC and PCC pavement recommendations for BRT loadings.
- Conduct geotechnical evaluations of the subsurface materials and conditions for strength, compressibility, stability, drainage, and other relevant considerations.
- Develop foundation conclusions and recommendations for the design of all project related facilities and trackbed.
- Identify the location of all existing, abandoned, and proposed utilities that may affect or be affected by the project.

Work By Others:

- CATS will conduct a search to identify all readily available City and County subsurface information and data and provide to Consultant.

Deliverables:

- Geotechnical Investigation Report.

3.3: PRELIMINARY ENGINEERING

Approach:

The purpose of this task is to provide preliminary engineering design of the streetcar alignment to a 10% design level.

The Consultant shall have a solid understanding of existing area plans, ordinance requirements, land use plans, and goals for the neighborhoods intersecting the corridor. Integrate or incorporate recommendations from these adopted or existing land use plans into the streetcar design plans.

Consultant Activities and Assumptions:

The consultant will provide preliminary engineering design services to define the streetcar alignment, including the following:

Track Alignment and Design:

- Establish the vertical and horizontal alignment of the track.
- Develop 2 general alignment options (side running and center running) and coordination with Center City Transportation Study
- Develop up to 4 potential transition/intersections
- Develop 2 alignment alternatives for two termini
- Assess phasing/extension implications
- Mark Dorn (URS) will make 10 trips.
- URS will assist in the assessment of alignment options in three general alignment segments.
- Design cross-section and define structural concept for the embedded rail slab with objective of minimizing construction time, disruption of street activities and impacts on utilities.
- Identify and prepare conceptual design of streetcar stop locations. (Furnishings of stops to be provided in Task 5.0: Conceptual Urban Design and Streetscape Design).
- Evaluate other transportation users of Trade Street including: auto, delivery truck and bus circulation; ingress and egress to existing buildings and parking garages; and on-street parking. Prepare recommendations on continued utilization or modification/management of such utilization under two scenarios: 1. Co-location of the southeast and west corridor BRT alignment; and 2.The southeast and west corridor BRT system being located on an alternative route.

- Evaluate underground and overhead utilities and design of the streetcar to define impacts and develop methods of minimizing impacts to utilities thereby managing costs.
- Evaluate the potential impact of overhead structures, especially the Norfolk-Southern and Interstate Highway bridges, and prepare alternative design solutions to address any impacts of these structures on streetcar operations.
- Evaluate the potential impact of any below grade structures (including the Irwin Creek and Little Sugar Creek culverts) and prepare alternative design solutions for any required structural modifications to accommodate streetcar.
- Define the location(s) and configuration for utility duct bank to be located along the entire length of the corridor. This duct bank is envisioned to provide electrical, communications and irrigation services for the corridor.
- Confirm project base mapping information from each utility in regards to the location of their existing facilities
- Identify potential locations of building extensions under the sidewalk
- As-built drawings for box culverts over Irwins Creek and Little Sugar Creek will be provided by CATS or CDOT.
- Design "typical" concepts for how traffic signal boxes, backflow preventers, and transformers are located along the corridor. (To be coordinated with Task 5.0: Conceptual Urban Design and Streetscape Design).
- Intersection turning movement counts provided by CDOT
- Model forecasts of future volumes by mode provided by CDOT
- Mainline analysis of Beatties Ford Road, Trade Street and Elizabeth Avenue
- Up to three AM Peak and three PM Peak hour intersection capacity analyses of up to 5 intersections by consultants
- Up to three AN Peak and three PM Peak hour intersection capacity analyses of 14 intersections on Trade St from I-77 to I-277 by CDOT
- Intersection capacity analysis methodology used by consultant team to be consistent with that used by CDOT
- Detailed circulation analysis of Trade Street between Caldwell Street and Church Street and between Graham Street and Cedar Street
- Determine power requirements for streetcar that is compliant with planned LRT system
- Identify substation requirements and produce candidate list of potential substation sites for the Trade Street alignment
- Determine ductbank requirements
- Coordinate with CATS operations staff to identify the need and type of streetcar signal system that will be compatible with CDOT operations
- Ron Clark (Elcon) will make 1 trip.
- A formal design criteria document will not be provided during this phase of the project.
- Streetcar design will be based on the design standard drawings developed for the Portland Streetcar system.
- Prepare engineering drawings (10% level of detail):
  - Track alignment, cross sections and general details
  - General profile for project

- More detailed profiles and potential grading information at critical locations
- Area of roadway improvements at intersections
- Location and construction footprint of proposed Streetcar stops
- Produce an existing utility composite for all public and private utilities in the right-of-way with the identification of potential utility conflicts including manhole relocations and transverse lines
- Identification of critical utilities in direct conflict with the streetcar infrastructure that may require relocation or replacement
- Structural conflicts will be identified
- Generic OCS layout of poles/profile at critical points in the alignment
- Identification of potential substations
- Traffic signals – identify intersections where new or modified signals are needed
- No special Striping/Signing plans will be developed. Lane configurations will be shown on the track/roadway drawings

- Assumes a reproduction budget of $10,150. Additional reproduction, if required, will be picked-up by CATS.
- No specifications will be provided during this phase of the project.

Vehicle design:

- The Portland Streetcar vehicle (Skoda) will be used as the design vehicle.

Special related sub-task:

Based upon the recommendations of other studies, the Consultant will evaluate the feasibility of constructing a traffic roundabout at the intersection of Elizabeth Avenue and Kings Drive. The evaluation will consider the potential interface of Streetcar in a vehicular roundabout environment and provide recommendations on potential means of mitigating identified impacts on streetcar operations.

Coordination with Others:

- Coordination with CDOT on traffic operation issues.
- Coordinate with the existing and planned expansion of the bus system operations.
- Coordinate with Planning, CDOT and Engineering on Capital Program needs and issues.
- Coordinate with public utilities – Duke Power, Bell South, etc., on capital program needs and issues and any required relocation of existing utilities.
- Coordinate with Central Piedmont Community College and integrate the recommendations of the CPCC Master Plan.
- Coordinate with adjacent property owners and potential development interests on both development and redevelopment needs and issues.
- Coordinate with Planning, Neighborhood Development and Economic Development on development and redevelopment needs and issues.

- Coordinate with the Southeast/West Rapid Transit Team to integrate the streetcar design with the Rapid Transit Vehicles along Trade Street/Elizabeth Ave.

Deliverables:

- Conceptual engineering and design plans and profile drawings (to 10% completion) as described above.
- 1"=100' scale drawings delivered as half sized (11x17) drawing set (50 scale full size).
- Roll map designs for use in alignment assessment, technical and public meetings
- Technical assessment (memo or report) of alignment options summarizing the potential impacts to public infrastructure with each alignment alternative, potential transition points and termini.
- Technical memo identifying all public and private utilities in the general right-of-way for the project.
- Meeting minutes of design coordination meetings with each utility
- Summary of utility design issues/conflicts
- Technical memo documenting the visual assessment of condition and evaluation of suitability for supporting streetcar operations as well as potential design solution(s) and recommendations.
- Traffic analysis memorandums to support the alignment analysis. Final report documenting traffic and streetcar operations, potential impacts to the transportation system and recommendations.
- Technical report documenting the various streetcar systems design elements.
- Technical report summarizing proposed streetcar operations, its integration into the transportation network and recommended streetcar signaling requirements to be designed in later phases of the Project.

TASK 4.0: CONCEPTUAL DESIGN OF THE OF CENTRAL AVENUE AND BEATTIES FORD ROAD STREETCAR EXTENSIONS

Purpose:

The purpose of this task is to provide conceptual engineering services for the planning and design of a "Portland" type streetcar project for the extensions for the Central Avenue Streetcar extending from the Presbyterian Hospital end of the Trade Street element to the vicinity of Eastland Mall using Central Avenue for the majority of the route, and for the Beatties Ford Road Streetcar extending from the vicinity of Johnson C. Smith University along Trade Street and Beatties Ford Road to approximately I-85.

4.1: SURVEYING AND MAPPING

Purpose:
The purpose of this sub-task is to prepare the necessary survey mapping to support project conceptual engineering services.

Approach:
The Consultant will prepare the following mapping and survey information:

- Color aerial photography at a scale of 1' = 200' for the length of the corridor and covering approximately two full city blocks to each side of the alignment.
- Survey mapping at a scale of 1" = 50' covering the full width of the right-of-way (assumed to be 50 feet either side of street centerline) into abutting properties a sufficient distance to define edge of sidewalk, major site features (fences, wall, etc.), and the fronts of buildings and building entrances. The survey shall provide topography at a level sufficient to define profile and cross-section conditions. The survey shall locate major surface features (utility covers, fire hydrants, light standards, utility poles, and locate major sub-surface utilities. Obtain verification from respective utilities and controlling public agencies for all utilities. Indicate if utility is certain or surmised. Base mapping will be used to develop a Digital Terrain Model (DTM) sufficient to produce 1 foot contours
- Survey ground controls based horizontally on NAD83 datum and vertically on NAVD88 datum and tied to NCGS or city of Charlotte Monumentum
- No deed research..
- Survey mapping of all overhead structures within the study width as defined above, including bridges, building canopies, projecting signs, and similar structural features.
- Survey mapping of the Central Avenue crossing of the CSX railway tracks.

Work By Others:

- CATS will provide all City standards applicable to surveying services
- CATS will provide existing GIS, aerial photography and other special surveys as are available for the study area.

Deliverables:

- Survey mapping including all utilities as described above will be provided in hard copy and digital form. Survey mapping will be vertical color aerial photography at flight negative scale of 1"=200'
- Detailed underground and overhead survey of all utilities.

4.2: GEO-TECHNICAL AND SUB-SURFACE UTILITY INVESTIGATIONS

Approach:
The consultant will provide geo-technical surveys related to major culverts and other sub-surface features that may present significant obstacles for streetcar operations as required to support the conceptual design of the proposed streetcar alignment.

Consultant Activities and Assumptions:

- Work to be completed by Trigon.

- Assess existing pavement structural section at 25 locations covering Hawthorne Lane and Central Avenue; 10 locations along Beatties Ford Road
- Conduct pavement condition survey by pavement cores or other method. For strength, compressibility, stability, drainage, and other relevant considerations.
- No pavement design recommendations or geotechnical analysis
- Identify the location of all existing, abandoned, and proposed utilities that may affect or be affected by the project.

Work By Others:

- CATS will conduct a search to identify all readily available City and County subsurface information and data and provide to Consultant.

Deliverables:

- Assessment of existing pavement structural section covering Hawthorne Lane and Central Avenue and Beatties Ford Road.

4.3: CONCEPTUAL ENGINEERING

Approach:

The purpose of this task is to provide conceptual engineering design of the streetcar alignment to a 10% design level that will define the potential alignment as well as define and assess potential problems associated with the corridor and alignment.

The planning for the streetcar extensions will be based upon a solid understanding of existing area plans, ordinance requirements, land use plans, and goals for the neighborhoods intersecting the corridor. The Consultant will integrate or incorporate applicable recommendations from these adopted or existing land use plans into the streetcar design plans.

Consultant Activities and Assumptions:

The consultant will provide conceptual engineering design services to define the streetcar alignment, including the following:

1. Evaluation of alternatives for connecting the Trade Street Streetcar to Central Avenue including Hawthorne Lane and Kings Drive.

<u>Track Alignment and Design:</u>

- Establish the potential alignment and location of the track within the street cross-section with definition of anticipated vertical and horizontal alignment problem area.
- Determine if the structural concept for the embedded rail slab developed for the Trade Street corridor is applicable for the extensions.
- Develop 2 general alignment options (side running and center running) and coordination with Center City Transportation Study
- Develop up to 6 potential transition/intersections

- Develop 2 alignment alternatives for two termini
- Assess phasing/extension implications
- Mark Dorn (URS) to make 5 trips.
- Assist in the assessment of alignment options in two to three general alignment segments for each extension.
- Identify potential streetcar stop locations and define furnishings to be incorporated into the stops.
- Evaluate other transportation users of the corridors including: auto, delivery truck and bus circulation: ingress and egress to existing properties; and on-street parking, and prepare recommendations on continued utilization or modification/management of such activities.
- Confirm project base mapping information from each utility in regards to the location of their existing facilities
- Evaluate underground and overhead utilities to define areas of potential significant impacts and define general approach to minimizing impacts.
- Evaluate alternatives for crossing CSX track on Central Ave.
- One at-grade and one grade-separated alignment option will be studied for the CSX crossing
- Evaluate alternatives for the Hawthorne Street bridge over Independence Boulevard to accommodate the Streetcar track.
- As-built drawings are available for two structures: Hawthorne Lane over Independence Expressway and Beatties Ford Road over the Brookshire Freeways and NS Railroad.
- Three alternatives will be investigated on the two structures: track on top of existing deck in exclusive lane; track embedded into deck in shared lane; or track on separate structure.
- Evaluate the potential impact of overhead structures, and prepare alternative design solutions to address any impacts of these structures on streetcar operations.
- Evaluate the potential impact of any below grade structures (including culverts) and define alternative design solutions for any required structural modifications to accommodate streetcar.
- Design “typical” concepts for how traffic signal boxes, transformers, duct banks and other supporting utilities are to be provided along the corridors.
- Intersection turning movement counts provided by CDOT.
- Model forecasts of future volumes by mode provided by CDOT
- Perform mainline analysis only of Beatties Ford Road, Hawthorne Lane and Central Avenue
- Peak hour intersection capacity analyses of up to 19 intersections by consultant, CDOT will recommend which intersections from this group should be selected for up to three AM Peak and three PM Peak hour intersection capacity analyses
- Develop power requirements for streetcar that is compliant with planned LRT system
- Identify substation requirements and produce candidate list of potential substation sites for the Trade Street alignment

- Identify ductbank requirements
- Consultant will coordinate with CATS operations staff to identify the need and type of streetcar signal system that will be compatible with CDOT operations.
- Ron Clark (Elcon) will make 1 trip.
- Engineering drawings will include:
  - Track alignment, cross sections and general details
  - General profile for project
  - More detailed profiles and potential grading information at critical locations
  - Up to 6 typical roadway improvements at intersections
  - Location and construction footprint of proposed Streetcar stops
  - Existing utility composite for all public and private utilities in the right-of-way with the identification of potential utility conflicts including manhole relocations and transverse lines
  - Identification of critical utilities in direct conflict with the streetcar infrastructure for possible relocation or replacement
  - Structural conflicts will be identified
  - Traffic signals – identify intersections where new or modified signals are needed
- Assumes a reproduction budget of $15,150. Additional reproduction, if required, will be picked-up by CATS.

Deliverables:

- Conceptual engineering and design plans and profile drawings to 10% completion as described above.
- 1"=100' scale drawings delivered as half sized (11x17) drawing set (50 scale full size).
- Roll map designs for use in alignment assessment, technical and public meetings
- Technical assessment (memo or report) of alignment options summarizing the potential impacts to public infrastructure with each alignment alternative, potential transition points and termini.
- Technical memo identifying all public and private utilities in the general right-of-way for the project.
- Summary of utility design conflicts
- Technical memo documenting the visual assessment of condition and evaluation of suitability for supporting streetcar operations as well as potential design solution(s) and recommendations
- Technical memo identifying the potential alignment alternatives for crossing the CSX railroad, their potential impacts and recommended solutions
- Traffic analysis memorandums to support the alignment analysis. Final report documenting traffic and streetcar operations, potential impacts to the transportation system and recommendations.
- Technical report documenting the various streetcar systems design elements

- Technical report summarizing proposed streetcar operations, its integration into the transportation network and recommended streetcar signaling requirements to be designed in later phases of the extensions.

TASK 5.0: CONCEPTUAL URBAN DESIGN AND STREETSCAPE DESIGN FOR THE TRADE STREET CORRIDOR

Purpose:
The Consultant will provide urban design and streetscape services for the Trade Street Corridor from Kings Drive to I-77. (Note: Existing plans will determine the streetscape plan for the portion of Elizabeth Avenue from Kings Drive to Hawthorne Lane.) These services will provide the architecture of the street to accommodate transit, pedestrians, bicycles, and vehicles.

5.1: STREETSCAPE DESIGN

Approach:
The design recommendations should recognize the hierarchy of pedestrian-oriented streets as defined in the Center City Transportation Study and the Urban Street System Guidelines that outline the function and design for the Center City street system. The Consultant shall define the corridor edge guidelines within the Center City needed to make the street a grand urban street. Additionally, the Consultant shall develop design concepts that emphasize the uniqueness of the sub-areas (i.e. Gateway Center, Government Center, historic Fourth Ward, Sports & Entertainment District, 24 Block CBD Pedestrian Core and the Square) including recommendations on artwork, landscaping, historic identity or other unique ways to define the sub-areas. The Center City 2010 Vision Plan stated that the corridor should become memorable. Give careful attention to planning current initiatives within the Central Piedmont Community College campus, the Elizabeth Avenue corridor, and the Gateway area. The design process shall consider views from the street and to the street. All design activities shall be responsive to ADA accessibility standards.

The plan recommendations will recognize the previously completed and currently underway efforts that address segments of the corridor. These include the Center City 2010 Plan, Center City Transportation Study, Urban Street Design Guidelines, Elizabeth Avenue Street improvements, Central Avenue Pedscape Plan, Eastland Area Plan and street improvements, and the West End Pedscape Plan.

The focus of the plan will be on the area from building face to building face. This plan will be a highly visual document, with extensive graphic representation of concepts related to the Streetcar. The plan will provide the basis for decision-making as the streetcar goes into detail design.

The document will address the following:

- Goals for the Streetcar System (transportation, land use, urban design, economic development, etc.)
- Unifying elements to be that will tie the entire Streetcar system together (these might include items such as shelters, signage, public art, etc.) Design principles should be developed for those items determined to be unifying elements. Illustrative examples of these elements should also be included in the document.
- Other corridor-wide guidelines/principles ("typical" concepts for traffic signal boxes, backflow preventers, transformers)

This Streetcar vision plan will also delineate geographic sub-areas along the line. For each sub-area, the following items should be addressed:

- Specific objectives for this sub-area (transportation, land use, urban design, and economic development, etc.).
- Theme for sub-area or characteristics that make this sub-area unique and guidelines for reinforcing these unique areas
- Alignment of the streetcar through this sub-area
- Prototypical and special street cross section(s) from building face to building face which identify the location of the streetcar (center versus outside lane), vehicular lanes, bicycle lanes (if any), pedestrian/sidewalk space, landscaping, etc.
- Description and mapping of surrounding area, including major land use generators (existing and future) that can be served by the streetcar (typically within ¼ mile)
- Map of major pedestrian routes to the streetcar line from major generators
- Definition of sidewalk locations and conditions to promote pedestrian connectivity within and around the corridor
- Special sidewalk materials/treatment if applicable for sub-area
- Potential streetcar stop locations and furnishing/shelters/ treatment of the stops
- Signage concepts
- Recommended changes to the pedestrian and bicycle network to enhance access to the streetcar, including pedestrian crossings (conceptual level)
- Changes to the vehicular transportation system needed as a result of streetcar implementation (conceptual level)
- Aesthetic treatment of catenary system
- Siting and treatment of substations
- Street and pedestrian lighting concepts, especially unique characteristics and relationship to catenary system
- Landscaping treatments and street tree planting concepts
- Unique urban design features such as seating, planters, bicycle racks, art elements, trash receptacles, banners, drinking fountains, signage, information kiosks, and other street furniture amenities

- Concepts for plazas and other open spaces, street vending, sidewalk dining, and entertainment stations
- Concepts for connections with existing and/or proposed plazas, greenways and other open spaces.
- Delineation of overhead utility locations/treatment
- Design concepts that address means to make bridges and rail infrastructure architecturally significant and pedestrian hospitable
- Suggested design guidelines for the siting and façade treatment of buildings along the streetcar line to encourage pedestrian access
- Recommendations for improvements to existing structures to make improvements that will make them more consistent with the corridor vision
- Suggested uses that would enhance the streetcar environment in each sub-area

Consultant Activities and Assumptions:

The Consultant shall prepare a conceptual urban design and streetscape plan, which includes the following design elements:

- Prepare cross-sections of typical and special sections of the corridor that define the allocation of space in terms of transit guideways, vehicular lanes, bicycle lanes (if any) and pedestrian/sidewalk space.

- Building upon the Pedestrian Hierarchy as developed in the Center City Transportation Study, map the significant existing and future uses within ¼ mile of the Trade Street Corridor (i.e. employment, shopping, entertainment, institutional, and high density residential) which may generate streetcar customers. Map the major likely pedestrian pathways from these activities to the nearest streetcar stop.
- Design the sidewalk materials, locations and widths for each of the individual typologies as identified in the Trade Street concept study done by HNTB.
- Prepare a streetscape/landscape plan that provides pedestrian comfort and safety, and that incorporates appropriate elements, including but not limited to the following:
  - Street crosswalk locations, configuration and materials.
  - Pedestrian crossing controls.
  - Street and pedestrian lighting: Develop a unified lighting system that provides safety for streetcar stops, pedestrian lighting along the entire route, and roadway lighting. The system needs to have a unique character.
  - Street trees.
  - Catenary pole locations.
  - Seating and places to converse.
  - Planters.
  - Bicycle racks.
  - Art elements.
  - Trash receptacles.
  - Banners.

  - Street vending, eating and entertainment staging.
  - Drinking fountains.
  - Historic elements.
  - Signage – Identification, traffic control, transit, and way finding signage. Recommend what and where way-finding signage will be displayed along the corridor.
  - Information kiosks.
  - Other street furniture amenities.
- Design Streetcar stops (and other transit stops as appropriate) including shelters, electronic communications, signage, furniture, and services.
- Define design concepts that address means to make bridges and rail infrastructure architecturally significant and pedestrian hospitable.
- Develop specific guidelines for how new and rehabbed buildings are sited to encourage interaction between the pedestrians and in the buildings.
- Define design concepts for appropriate connections with plazas and parks.
- The consultant will not designing to a predetermined budget for streetscape. We are designing the “ideal” streetscape, for which several funding sources may be used.
- The City forces will maintain the built streetscape. We will coordinate the design with their input.
- Tryon Street should be used as the standard of the level of quality for Trade Street.
- Charlotte Center City Partners will be involved in the design process.
- No artists will be involved at this stage of the design process.
- The consultant will utilize “off the shelf” streetscape elements as much as possible, with some elements custom designed.
- Uniformity in streetscape design will prevail, with some variety from block to block.
- The design scale will be 1:20 but shown on plans at 50 scale and delivered in half-size drawings (1”=100’ full size, consistent engineering drawings).
- Preliminary design drawings will be required to the 10% level of resolution.
- Craig Amundson (URS) will make 6 trips.
- A Senior Urban Designer(s) (URS) will make 12 trips.
- Don Hilderbrandt (HNTB) will make 3 trips.
- There will one DRAFT and one FINAL Planning and Design Framework document prepared
- All reports, drawings and illustrations will be delivered in electronic format
- Two alternative designs will be provided for each sub area theme
- No more than two alternatives will be prepared for Signage, Street and Pedestrian Lighting, Landscape and Tree Planting, and Streetscape design concepts on Trade Street
- Assumes a reproduction budget of $7,150. Additional reproduction, if required, will be picked-up by CATS.

Deliverables:

- Conceptual streetscape/landscape plans incorporating the urban design elements as described above.
- Renderings, computer simulations or other presentation tools displaying the urban design opportunities for public meetings.
- A technical paper/report summarizing relevant previous planning and design work and decisions made. It will be accompanied by graphics illustrating those critical aspects affecting the Trade Street Corridor.
- A technical paper/report confirming previous principles and guidelines and supporting graphics illustrating principles and guidelines for the Trade Street Corridor.
- An urban design vision plan will be developed for the proposed streetcar line that includes the Trade Street Corridor in Uptown Charlotte, the Beatties Ford Road Corridor, and the Central Avenue Corridor. In addition, the vision plan will address the Center City Streetcar Loop.
- A comprehensive urban design plan for Trade Street integrating unique sub-areas, historical features, development and redevelopment, open space and landscape design, lighting, cross sections allocating right-of-way, platform architecture, visual and spatial analysis. The plan will be illustrated and described with presentation graphics and drawings.

TASK 6.0: CONCEPTUAL PLANNING AND FEASIBILITY ANALYSIS OF THE DOWNTOWN STREETCAR LOOP

Purpose:
The purpose of this task is to provide conceptual engineering services for the planning and design of a "Portland" type streetcar project for the Downtown Streetcar Loop following a route that will be defined as some combination of 11th Street, 10th Street, 9th Street, 8th Street or 7th Street on the north side, McDowell Street or Davidson Street on the east side, Stonewall Street or Second Street on the south side, and Graham Street, Mint Street or Pine/Poplar Streets on the west side.

6.1: SURVEYING AND MAPPING

Purpose:
The purpose of this sub-task is to prepare the necessary survey mapping to support project conceptual engineering services.

Consultant Activities and Assumptions:
- The Consultant will prepare the following mapping and survey information:
- Exisitng available color aerial photography will be used.
- No new base mapping will be conducted.
- A small allowance is available to conduct survey at specific critical locations to support the development of alternatives

Work By Others:

- CATS will provide all City standards applicable to surveying services.
- CATS will provide existing GIS, Aerial photography and other special surveys as are available for the study area.

Deliverables:

- Survey mapping as described above will be provided in hard copy and digital form.

6.2: GEO-TECHNICAL AND SUB-SURFACE UTILITY INVESTIGATIONS

Work By Others:

- CATS will conduct a search to identify all readily available City and County subsurface information and data and provide to Consultant.

Consultant Activities and Assumptions:

- No geotechnical investigations will be conducted.

6.3: CONCEPTUAL ENGINEERING

Approach:

The purpose of this task is to provide conceptual engineering design of the streetcar alignment to level that will define the potential alignment as well as define and assess potential problems associated with the corridor and alignment. The definition of alternative alignments shall be closely coordinated with the pedestrian and vehicular circulation recommendations of the Center City Transportation Study, as well as the land use and urban design recommendations of the First Ward Plan, Second Ward Plan, Third Ward Neighborhood Vision Plan, and Fourth Ward Plan to determine parameters and implications for a loop system proposal.

Consultant Activities and Assumptions:

The consultant will conduct planning and feasibility analysis of a downtown streetcar loop. The evaluation will include:

- Evaluation of an alternative analysis, including opportunities and constraints, key land uses, major destinations, fatal flaws, etc.
- This exercise is a feasibility study/alternatives analysis without any evaluation of technologies. The preferred outcome is the development of a preferred alignment of loop distributor streetcar line (or alignment other than the loop).
- The feasibility evaluation will be based on public input, engineering feasibility and/or limits (fatal flaw), and trip generation.
- No new traffic count data will be collected. City will provide existing available traffic data or conduct new counts.
- Evaluation of the following streets (and others identified as feasible candidates) for their suitability/compatibility with streetcar construction and operations and inclusion in a streetcar loop system

East Side	**South Side**
McDowell Street	Stonewall Street

Davidson Street

North Side
- 11th Street
- 10th Street
- 9th Street
- 8th Street
- 7th Street

Second Street

West Side
- Graham Street
- Mint Street
- Pine/Poplar Streets

- The consultant will assist in the assessment of two alignment options in each quadrant of the City.
- Establish the potential alignment and location of the track within the street cross-section with definition of anticipated vertical and horizontal alignment problem area. Develop 2 general alignment options for each quadrant of the City
- Identify general, potential design conflicts with utilities
- Develop up to two streetcar crossings/connections and one LRT
- Develop 2 alignment alternatives for two termini
- Assess phasing/extension implications
- Mark Dorn (URS) will make 5 trips
- Identify potential streetcar stop locations and define furnishings to be incorporated into the stops.
- Evaluate other transportation users of the alternative loops including: auto, delivery truck and bus circulation; ingress and egress to existing properties; and on-street parking, and prepare recommendations on continued utilization or modification/management of such activities.
- Evaluate underground and overhead utilities to define areas of potential significant impacts and define general approach to minimizing impacts.
- Evaluate the potential impact of overhead structures, and prepare alternative design solutions to address any impacts of these structures on streetcar operations.
- Evaluate the potential impact of any below grade structures (including culverts) and define alternative design solutions for any required structural modifications to accommodate streetcar.
- Design “typical” concepts for how traffic signal boxes, transformers, duct banks and other supporting utilities are to be provided along the corridors.

Prepare a final recommendation of a preferred loop alternative.
Travel demand model forecasts of future volumes by mode provided by CDOT
Up to 2 alternative routes analyzed
Mainline ADT analyses for alternative routes
Critical lane intersection capacity analyses for up to 30 key intersections for preferred route provided by CDOT for intersections inside Freeway Loop, other intersections outside Freeway Loop provided by consultant. CDOT will recommend which intersections from this group should be selected for up to three AM Peak and three PM Peak hour intersection capacity analyses
Determine power requirements for streetcar that is compliant with planned LRT system
Identify substation requirements and produce candidate list of potential substation sites for the Trade Street alignment
Determine ductbank requirements
Consultant will coordinate with CATS operations staff to identify the need and type of streetcar signal system that will be compatible with CDOT operations.
Ron Clark (Elcon) will make 1 trip.
Engineering drawings will include:

- Track alignment, cross sections and general details
- Profile for project at critical points of the alignment to assess feasibility
- Area of roadway improvements at intersections
- Location of proposed streetcar stops
- Identify existing public and private utilities in the right-of-way
- Structural conflicts will be identified
- Traffic signals – identify intersections where new or modified signals are needed
- No special Striping/Signing plans will be developed. Lane configuration will be shown on the track/roadway drawings

- Assumes a reproduction budget of $5,150. Additional reproduction, if required, will be picked-up by CATS.

Deliverables:

- Conceptual design plans to 10% completion level of streetcar loop alternatives. Include options to operate outside of I-277 loop.
- 1"= 100' scale drawings delivered as half sized (11x17) drawing set (50 scale full size)
- The feasibility assessment report will describe the universe of potential alternative alignments that meet the Purpose and Need, including an evaluation of alignments, potential trip generators and a preliminary integration plan. The detailed technical report on loop alternatives, will include pros and cons of each option and key land uses, and operational characteristics. Report will identify the details of the recommended route and why it was selected, the activity centers and destinations that will be linked, and patronage forecasts.
- Exhibits and presentations on costs, benefits, and impacts of loop alternatives for public meetings.

- Technical memo identifying public and private utilities in the general right-of-way for the project as observed in field and through records research with the utilities.
- Roll map designs for use in alignment assessment, technical and public meetings
- Traffic analysis memorandums to support the alignment analysis. Final report documenting traffic and streetcar operations, potential impacts to the transportation system and recommendations.
- Technical report documenting the various streetcar systems design elements
- Technical report summarizing proposed streetcar operations, its integration into the transportation network and recommended streetcar signaling requirements to be designed in later phases of the extension.

TASK 7.0: COST ESTIMATING

Purpose:
The purpose of this task is to prepare cost estimates for all conceptual design elements and the respective alternatives contained in the Scope of Work.

7.1: PREPARE A PRELIMINARY COST ESTIMATE

Approach:
The Consultant shall prepare preliminary cost estimates for each element of the streetcar project and the design alternatives.

Consultant Activities and Assumptions:
The cost estimate shall define the level of detail for each element:
- Trade Street Corridor.
- Central Avenue Extension.
- Beatties Ford Road Extension.
- Urban Design and Streetscape Design.
- Center City Streetcar Loop.
- Cost will be based on the latest streetcar construction information and local CDOT information for general civil/infrastructure elements
- Assumes a reproduction budget of $1,000. Additional reproduction, if required, will be picked-up by CATS.

Deliverables:
- Streetcar infrastructure, urban design, and streetscape design cost estimates (preliminary or conceptual).
- Estimate of annual operating and maintenance costs.

TASK 8.0: OPERATIONS PLANNING

Purpose:
The purpose of this task is to prepare and provide Operating and Maintenance Plans for each element of the streetcar project. The Consultant shall make recommendations of alternative locations for a streetcar maintenance facility.

8.1: PREPARE AN OPERATIONS PLAN

Consultant Activities and Assumptions:
The Consultant will prepare the Operating Plan for the streetcar operations. The evaluation will include:

- CATS has adequate data on ridership, operational statistics and maintenance costs (for buses) – no on-board survey, or other data collection necessary.
- Coordination with vehicle consultant will be facilitated by CATS
- Collect and analyze base operating data for both bus and rail operations and bus and rail ridership.
- Assumes that a set of evaluation criteria based on goals and objectives established for the facility will be developed and then used to select a primary and secondary site for the maintenance facility (2 sites total).
- Concept plans for the maintenance facility (site sketches that indicate preferred structure and track configuration) will be developed for each site (2 sites total) along with a technical memorandum further refining issues with and barriers to construction.
- The secondary maintenance facility site plan will be available to serve as either a temporary site or as a back-up site in case there are any unforeseen delays in the implementation of the primary site.
- Once the primary maintenance facility site is chosen a refined concept/site plan will be produced to depict more detailed features to include.
  - Functional Floorplans
  - Facility Design and Integration into site and surrounding area.
  - Order of Magnitude Costs for the Facility
- A potential vehicle access connection for maintenance on the LRT line for movement of trolley cars to a maintenance facility on the South Corridor will be developed as part of Task 6.
- John Schwanabeck (RSH) will make 2 trips.
- CATS will provide bus system and streetcar statistics including: headways, running times, dwell times, transfer points, platform, deadhead and revenue miles.
- CATS schedulers will be available to review and assist with run-cutting and adherence to Drivers' Union CBA
- Evaluate and recommend a proposed maintenance facility location for the streetcars. Determine potential alternative sites and analyze community impacts. Determine suitability based on operating needs and an established set of site selection criteria.
- Create an Operations and Maintenance Plan for streetcar operation. The Plan shall provide a full description of operating requirements. It will address the streetcar service, including assumed schedules, passenger communication systems, fleet needs, support vehicle and equipment needs,

maintenance and operating facility needs, staffing requirements and a hiring plan.
- o Create a transit Facility Operations Plan providing preliminary plans for how the streetcar services will integrate with transit facilities (Charlotte Transportation Center, Multimodal Station, Eastland and Beatties Ford transit center facilities).
- o Create an Operations Integration Plan making preliminary recommendations on integrating the streetcar with existing and planned bus operations, both within the streetcar corridor as well as connecting bus services.
- o Prepare an estimate of annual operating and maintenance costs for streetcar operation.
- o Assumes a reproduction budget of $3,500. Additional reproduction, if required, will be picked-up by CATS.

Deliverables:

- o Recommendation of location(s) for the proposed maintenance facility.
- o Technical memorandum summarizing the existing and planned transit operations by CATS.

Technical memo/report outlining the maintenance facility and site requirements, the identification of potential sites (both permanent and temporary) and a brief assessment of their availability and critical issues related to implementation.
Technical memo/report that outlines streetcar operations and newly required bus operations. The document will also include descriptions of recommended support functions, supervisory levels, labor forecasts and optimization.
A preliminary plan for how the streetcar services will integrate with transit facilities (Charlotte Transportation Center, Multimodal Station, Eastland and Beatties Ford transit center facilities).
Bus route realignment plan, based on existing and projected passenger data, that optimizes streetcar ridership without incurring too many transfers. Also, the plan will include a narrative on how the streetcar system will be integrated with future LRT and BRT facilities.
A technical report outlining the cost of streetcar operations and maintenance generated from labor forecasts and service level estimates.

TASK 9.0: PREPARATION OF ENVIRONMENTAL STUDIES

Purpose:
The purpose of this task is to identify the social, economic, and environmental conditions that are present in the study area and to assess the potential impacts that may be associated with the locally preferred alternative.

9.1: PREPARE ENVIRONMENTAL STUDIES

Approach:
Following the identification of existing conditions, an examination of the project's impacts shall be conducted. These impact assessments shall be conducted in

accordance with NEPA requirements and FTA guidance. The impact assessment shall consider both short and long term impacts, construction period impacts, and will identify and evaluate alternative mitigation measures where impacts are considered adverse.

The environmental analysis shall cover a wide range of areas of environmental concern. The documentation and work products developed in response to this task will satisfy the National Environmental Policy Act (NEPA), state and local government regulations (Specific regulations are included in the discussion of each task). The work shall also conform with Federal Transit Administration (FTA) requirements.
Each area of environmental concern will be analyzed in a separate section of the Environmental Assessment document. This document will contain an abbreviated version of the Project's Purpose and Need Statement and a description of the alternatives to be considered. Each section will contain a detailed description of the Affected Environment (Existing Conditions), an analysis of the direct, indirect and cumulative impacts resulting from the alternatives under consideration, applicable regulations, procedures and other applicable information.

Consultant Activities and Assumptions:

The consultant will conduct an analysis to determine the appropriate level of Environmental Analysis needed for the streetcar project. (Categorical Exclusion, Environmental Assessment/Finding of No Significant Impact (EA FONSI), DEIS, etc). Areas that may need to be examined include:

1. Land use and zoning
2. Social and economic conditions
3. Neighborhoods and community services
4. Soils, Geology
5. Ecosystems
6. Water resources
7. Noise and vibration levels
8. Electromagnetic radiation levels
9. Air quality conditions
10. Hazardous and regulated material locations
11. Historic and archeological resources
12. Displacements/relocations
13. Parklands resources
14. Traffic and Transportation conditions
15. Visual/Aesthetic resources
16. Construction period impacts.

- Coordinate meeting location and attendees of Scoping Meeting
- Prepare Scoping Meeting materials including mapping
- Attend 1 project scoping meeting with 2 people
- Process scoping comments
- Prepare Scoping Document – text, formatting, figures, tables

- Includes Draft and Final versions
- Coordination with all project disciplines
- Purpose and Need Statement 2 meetings for 2 people with CATS
- Includes, Draft, Draft Final and Final Versions of Purpose and Need
- Final Purpose and Need version will be provided as a “camera ready” document an electronic copy on CD
- Develop ICE study area
- Collect land use data
- 3 field days for 2 people on ICE
- Coordination with Charlotte Planning
- GIS mapping time
- Prepare ICE Technical Memorandum – text, formatting, figures, tables, and appendices
- Prepare ICE Technical Memorandum Draft and Final versions
- Establish baseline demographics for environmental justice analysis (EJ)
- Conduct benefits and impacts analysis for EJ analysis
- Attend 2 community meetings for 2 people for EJ analysis
- Prepare EJ Technical Memorandum – text, formatting, figures, tables, and appendices. Includes Draft and Final versions
- Calibrate and run air quality model and assess impacts
- Prepare Air Quality Technical Memorandum – text, formatting, figures, tables, and appendices
- Prepare Air Quality Technical Memorandum Draft and Final versions
- Noise, vibration and EMI assessment Includes 2 field days for 2 people
- Calibrate and run noise model and assess impacts
- Calculate electromagnetic interference, identify sensitive receptors and assess impacts, if necessary identify mitigation measures
- Prepare Noise, Vibration and EMI Technical Memorandum – text, formatting, figures, tables, and appendices
- Prepare Noise, Vibration and EMI Draft and Final Technical Memorandum versions
- Primary data source for hazardous materials sites is Environmental Data Resources, Inc. (EDR)
- Primary data source for utility information is City of Charlotte and project surveys
- Hazardous materials and utilities assessment includes 1 field day for 1 person
- GIS Mapping
- Prepare Hazardous Materials and Utilities Technical Memorandum – text, formatting, figures, tables, and appendices
- Includes Hazardous Materials and Utilities Draft and Final Technical Memorandum versions
- Social, Economic and Natural Resources assessment includes population, employment, and demographics data collection and analysis mapping time
- Conduct qualitative analysis of economic benefits and impacts from improved transportation

- Identify and document neighborhoods and community services
- Identify and assess impacts to wetland and ecological resources including habitat and threatened and endanger species. 1 field day for two people
- Assumes no wetland delineation required
- Assumes no ecological resources are impacted
- GIS mapping of resources
- Agency coordination
- Prepare Social, Economic and Natural Resources Technical Memorandum – text, formatting, figures, tables, and appendices
- Includes Social, Economic and Natural Resources Draft and Final Technical Memorandum versions
- Identification and reconnaissance-level work only to identify National Register-listed, Determined-Eligible (DOE), locally designated, NC Study List, and other potentially NR-eligible resources (375 structures) – No intensive investigations
- Environmental effects components related to information gathered during identification and reconnaissance-level phase. No environmental effects components included in these hours that relate to intensive-level identification.
- Cultural resource reconnaissance includes 3 field days for 2 people
- Agency coordination
- Prepare Cultural Resource Reconnaissance Technical Memorandum – text, formatting, figures, tables, and appendices
- Includes Cultural Resource Reconnaissance Draft and Final Technical Memorandum versions
- Collect data and describe and assess impacts to surface and ground water
- Agency coordination
- Prepare Water Resources Technical Memorandum – text, formatting, figures, tables, and appendices
- Includes Water Resources Draft and Final Technical Memorandum versions
- Description of regional transportation network and existing traffic conditions, parking, bike and pedestrian facilities, and freight movement.
- Does not include capacity analysis
- Includes traffic and transportation field visit over 2 days for 2 people
- Prepare Traffic and Transportation Technical Memorandum – text, formatting, figures, tables, and appendices
- Includes Traffic and Transportation Draft and Final Technical Memorandum versions
- Prepare EA – text, formatting, figures, tables, and appendices
- Includes EA Draft, Draft Final and Final Versions
- Final EA version will be provided as a “camera ready” document an electronic copy on CD
- Preparation of Preliminary Draft, Draft Version of FONSI Summary
- Preparation of Final FONSI to be prepared by CATS and submitted to review agencies

- Attend monthly meetings (total of 8 meetings) for 2 people
- Coordination with Project Team members
- Preparation of an Environmental Assessment / Finding of No Significant Impact (EA/FONSI) is the required level of environmental documentation.
- EA will be prepared from Executive Summaries from supporting technical documents.
- GIS data is readily available from City of Charlotte.
- Environmental investigations and impact analysis will focus on alternative alignments within one corridor.
- Minimal to no new right of way to be acquired.
- Assumes a reproduction budget of $7,500. Additional reproduction, if required, will be picked-up by CATS.
- Diana Mendes (DMJM) will make 2 trips.

Deliverables:

- Technical reports on the social, economic, and environmental (including environmental justice and urban design) impact evaluations; capital, operating, and life-cycle cost estimates; transportation impact assessments; and financial capacity analysis.
- An EA or DEIS as required, including stand-alone reports for special studies, the EA document, and FONSI.

TASK 10.0: STREETCAR IMPLEMENTATION PLAN

10.1: PREPARE STREETCAR IMPLEMENTATION PLAN

Approach:

The consultant will develop a streetcar implementation plan showing how the streetcar system can be implemented in phases. Work products include:

Consultant Activities and Assumptions:

- Identify design issues associated with the Phase 1 termini
- Identify policy issues associated with the implementation of each extension
- Assess design issues for each extension
- Determine Maintenance Facility requirements and potential expansion
- The focus of the Implementation Plan effort will be on the phasing of the implementation.
- Will also include a review of the capital and operating cost estimates and revenue projections.
- Ridership and revenue projections to be provided by CATS.
- Assumes a reproduction budget of $2,000. Additional reproduction, if required, will be picked-up by CATS.
- Mark Dorn (URS) will make 1 trip.

- Bob Peskin (AECOM/DMJM) will make 1 trip.

Deliverables:

- Recommended construction phasing strategy for the Trade Street / Central Avenue / Beatties Ford Road Streetcar including locations of interim streetcar terminus locations and construction schedule and phasing scheme.
- Recommended implementation strategy for the Downtown Streetcar Loop Project including strategy for establishing ultimate street cross-sections and utility locations prior to implementation.
- Coordinate with CATS Financial Consultant to develop a Financial Strategy Plan for the implementation of the streetcar system.

20 APPENDIX D

Appendix D

(Consultant Resumes Forthcoming)